UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

216154

# ACTION MEMORANDUM – RV3

**DATE:** SEP 26 2013

**SUBJECT:** Approval and Funding for a Removal Action and 12-Month Exemption at the Barth Smelting Corporation Site, Newark, Essex County, New Jersey

**FROM:** Kimberly Staiger, On-Scene Coordinator
Removal Action Branch

**TO:** Walter E. Mugdan, Director
Emergency and Remedial Response Division

**THRU:** Joseph D. Rotola, Chief
Removal Action Branch

**Site ID # A22L**

## I. PURPOSE

The purpose of this Action Memorandum is to request and document approval of the selected removal action described herein for the Barth Smelting Corporation Site ("Site"), located in Newark, Essex County, New Jersey. Two previous removal actions were undertaken by the United States Environmental Protection Agency ("EPA") at the Site which are described in the Action Memoranda dated March 27, 2013 and July 23, 2013. The removal action will address the threats posed by lead contaminated soil on a residential multi-family public housing complex located at 59-97 Chapel Avenue.

This Action Memorandum requests approval of $995,000 of which $704,000 is for mitigation contracting. Approval of this Action Memorandum will raise the total project ceiling for this Site to $1,060,000 of which $749,000 is for mitigation contracting. Conditions at the Site meet the criteria for a removal action under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §9601-9675, as documented in Section 300.415 (b)(2) of the National Contingency Plan.

There are no nationally significant or precedent-setting issues associated with the Site.

## II. SITE CONDITIONS AND BACKGROUND

The Comprehensive Environmental Response, Compensation, and Liability Information System Identification Number for the Site is NJN008010373.

The proposed action is considered a time-critical removal action.

## Site Description

The former Barth Smelting Corporation was located at 99 Chapel Street, Newark, New Jersey (see Figure 1). The Site includes the historic footprint of the former Barth Smelting Corporation facility (Block 2442, Lots 10, 11, 12) and the extent of lead contamination adjacent to the former facility, including a playground and grassy area adjacent to the community building on the Newark Housing Authority (NHA) Terrell Homes property located at 59-97 Chapel Street (Block 2442, Lot 1) (see Figure 3). Maps indicating the site boundaries are included in Appendix A.

The Site is located in a mixed residential/industrial neighborhood within the Ironbound Section of Newark, Essex County, New Jersey. The Site is bounded to the north and west by the Passaic River and the Essex County Riverfront Park and to the east by Chapel Street. The southern portion of the Site is located in the Terrell Homes, a low income residential housing complex operated by the NHA.

## 1. Removal site evaluation

A small recreational playground utilized by the Terrell Homes residents is located immediately adjacent the former Barth Smelting Corporation facility on the northeastern portion of the Terrell Homes property. A concrete wall is situated along this property line. EPA soil sampling performed in December 2012 identified elevated levels of lead in the surface soils (0-2' depth interval) of the playground exceeding EPA's residential soil screening level of 400 milligrams/kilogram (mg/kg). The average concentration of lead in the soils collected at the 0-1" depth within the playground was 1,127 mg/kg. Lead concentrations ranged from 103 mg/kg to 8,920 mg/kg, with the highest concentration detected in the western grassy area behind the dumpsters in the 18-24" below ground surface (bgs) depth interval.

From March 29 to April 1, 2013, EPA collected soil samples from all unpaved areas on the Terrell Homes property to determine if historic operations conducted adjacent to and on this property had impacted the soil. Lead concentrations exceeding EPA's residential soil screening level of 400 mg/kg were found within the top two feet of soil within a grassy area immediately adjacent to the community building which serves as a recreational area for the Terrell Homes residents and contains a basketball court and a sprinkler park area. The highest concentration of lead found in the top one inch of soil in this location during the March/April 2013 sampling event was 1,600 mg/kg.

Additional soil sampling was performed May 15-16, 2013 to characterize the nature and extent of the lead present in soils within the grassy area immediately adjacent the community building and sprinkler park. Elevated concentrations of lead were found along the property line and extending approximately 25' onto the Terrell Homes property. The highest concentration of lead detected with the X-Ray Fluorescence (XRF) was in the 6-12" depth interval at 2,330 mg/kg, and the highest concentration of lead in the top 1" of soil was 2,327 mg/kg.

On December 4, 2012, EPA collected soil samples from the backyards of two of the ten residential properties located on Chapel Street. The other properties were not sampled due to lack of access. Both properties are owned by the same property owner, and have undergone demolition and reconstruction within the past ten years. Based upon historical aerial photographs, the buildings present on the two lots sampled were demolished in 2006 and two new multi-family homes were constructed in their place. It

was learned, from conversations with the property owner, that fill material was brought in to bring the properties up to grade during the construction activities. Elevated lead levels are present in the top two feet of soil in both residential backyards sampled. The average lead concentrations at each depth interval (0-1", 1-6", 6-12", 12-18", and 18-24") is 743 mg/kg, 309 mg/kg, 2,492 mg/kg, 271 mg/kg, and 436 mg/kg, respectively. The maximum concentration found was 8,770 mg/kg in the 6-12" depth interval.

Background soil samples were collected from Lincoln Park located at Broad Street and Clinton Avenue in Newark, and at the Redemptoris Mater Archdiocesan Missionary Seminary located in Kearny, New Jersey across the Passaic River in an upwind direction from the former Barth Smelting Corporation facility. Four soil borings were installed in the background locations; two in Lincoln Park and two in the Redemptoris Mater Seminary. Soil samples collected from Lincoln Park had an average concentration of lead in the top 1" of soil of 587 mg/kg, with decreasing concentrations of lead found in the increasing depth intervals. All soil samples collected at the Seminary had concentrations of lead less than 400 mg/kg.

Thirteen soil borings were installed by EPA within the historic footprint of the Barth Smelting Corporation facility located on a portion of the 99 Chapel Street property on March 26, 2013. Asphalt paving was present throughout the eastern portion of the property on Block 2442, Lot 10, which sits immediately adjacent Chapel Street, and a thick subsurface concrete lens was encountered throughout the remaining portion of the property (Block 2442, Lots 11-12) at the 6-12" depth interval, with the thickness of the concrete paving varying from 6" to 12". An urban garden used by the two residents who live in an apartment located on the property was also sampled. The paved surface on 99 Chapel Street appears to extend to the property line with the Terrell Homes based upon observations made in the field by EPA. Soil erosion and soil washout from beneath the paved surface on the 99 Chapel Street property was observed along the property boundary with the Terrell Homes.

Analytical results indicate the presence of elevated concentrations of lead exceeding the EPA's industrial soil screening level of 800 mg/kg on the 99 Chapel Street property. The concentrations of lead ranged from 15 mg/kg to 11,000 mg/kg, with the highest concentration of lead detected at the 12-18" depth interval.

Based on the results of the RSE, it is recommended that a CERCLA Time-Critical removal action be undertaken to address the public health threats posed by lead contaminated soil at the Site. The removal action will include the removal of lead contaminated soil within the unpaved play areas along the northern boundary of the Terrell Homes property and construction of erosion controls to prevent lead contaminated soil present at the 99 Chapel Street property from migrating onto adjacent, unpaved play areas at Terrell Homes.

No action is planned at the two private residential properties on Chapel Street sampled by EPA in December 2012. Based upon historical photos and information provided by the property owner, the lead detected in the surface soil in both backyards is related to imported fill material and is not site related.

A copy of the Removal Site Evaluation is included in Appendix B of this document.

## 2. Physical location

The Site is located in a mixed residential/industrial neighborhood within the Ironbound Section of Newark, Essex County, New Jersey. The Site is bounded to the north and west by the Passaic River and the Essex County Riverfront Park and to the east by Chapel Street. The southern portion of the Site is located in the Terrell Homes, a low income residential housing complex operated by the NHA.

The Ironbound Section of Newark is the most densely populated neighborhood in a densely populated city, with housing stock mostly consisting of multi-story tenements and row homes. The Ironbound consists of four square miles within the East Ward of Newark and is bounded geographically by the Passaic River, the Newark Liberty International Airport, and Newark Penn railroad station. This neighborhood in Newark is a recognized Environmental Justice community with many disadvantages including poverty and crime.

Topographically, the Site is located at approximately 10 feet above sea level and is located at 40°44'9.49" N latitude, 74° 8'26.83" W longitude.

## 3. Site characteristics

The New Jersey Zinc & Iron Company, also known as the Newark Zinc Works, formerly operated on the properties now occupied by 99 Chapel Street Partners, the Newark Housing Authority's Millard E. Terrell Homes (Terrell Homes), and Essex County Parks Department (see Figure 3). The Zinc Works was one of the first commercial zinc oxide plants in the United States and operated on this location from 1848 to 1910. When New Jersey Zinc and Iron Company closed, the buildings were demolished. At some point after the closure of New Jersey Zinc, the property was sub-divided into five lots (Block 2442, Lots 1, 3, 10, 11, and 12) and was acquired by various parties.

In the 1930's, General Lead & Battery, a manufacturer of lead acid batteries, operated on Block 2442, Lots 10, 11, 12 (generally identified as 99 Chapel Street) that were formerly owned by New Jersey Zinc & Iron Company. From 1946 to 1982, Barth Smelting Corporation operated on the same three lots producing brass and bronze ingots and non-ferrous metals and alloys. Barth Smelting Corporation was listed as an unrecognized battery lead smelter site in a paper titled "Discovering Unrecognized Lead Smelting Sites by Historical Methods" written by William Eckel et al, and published in the American Journal of Public Health, April 2001, however several resources exist labeling Barth Smelting Corporation as a secondary copper smelting facility. Currently, Portwide Container, a cargo securing company, operates on this property.

In 1946, the Millard E. Terrell Homes, a low-income family development with 275 units, were constructed at 59-97 Chapel Street (Block 2442, Lot 1), a property formerly occupied by the New Jersey Zinc & Iron Company. The residential public housing complex is currently home to 784 occupants. Occupancy of public housing at all Newark Housing Authority properties is dictated by income, with preferences for elderly, disabled and DYFS (Division of Youth and Family Services) referrals.

The portion of the New Jersey Zinc & Iron Co. facility which has a street address of Rear 59-97 Chapel Street (Block 2442, Lot 3) has been mostly used for industrial purposes, after operations at the zinc smelter ceased. The Standard Bitulithic Company owned and operated an asphalt plant on this property from 1919 until 1982. Palmer Industries purchased this property in 1982 for use as a ship container

storage facility. At the time of purchase by Palmer Industries, the Site was undeveloped and remained undeveloped until the Essex County Improvement Authority (ECIA) claimed ownership of the property through eminent domain. The property has since been developed as a public park that opened on

May 30, 2012, and includes a soccer field and a baseball field with synthetic grass surfaces, tennis and basketball courts, a passive meadow, walking paths, two playground areas, a sprinkler park and a small parking area along the waterfront.

This is the third EPA Removal Action conducted at the Site.

**4. Release or threatened release into the environment of a hazardous substance, or pollutant or contaminant.**

Sampling and analysis conducted at the Site and during EPA's RSE identified the presence of lead. Lead is a CERCLA hazardous substance as defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14). The "Site" is a "facility" within the meaning of Section 101(9) of CERCLA, 42 U.S.C. § 9601(9), and the presence of lead in the soil at the Site constitutes a "release", as defined in Section 101(22) of CERCLA, 42 U.S.C. § 9601(22).

| Hazardous Substances | Statutory Source for Designation Under CERCLA |
|---|---|
| Lead (and lead compounds) | Clean Water Act, Section 307(a) and Clean Air Act Section 112 |

Soil samples collected by EPA from the unpaved play areas on the Terrell Homes property contained concentrations of lead greater than the residential soil screening level of 400 ppm. The results for lead in surface soil sampled at 0" – 1" ranged from 85 ppm to 6,030 ppm and in the 1" – 6" interval ranged from 46 ppm to 7,130 ppm. The results for lead in subsurface soil samples at 6" – 12" ranged from 18 ppm to 3,820 ppm, the 12" – 18" interval ranged from 27 ppm to 2,960 ppm and the 18" – 24" interval ranged from 6 ppm to 8,920 ppm.

Soil samples collected from the commercial property located at 99 Chapel Street by EPA contained concentrations of lead in excess greater than the industrial soil screening level of 800 ppm. The results for lead in surface soil sampled at 0"- 1" is 66 ppm and in the 1"- 6" interval ranged from 15 ppm to 11,000 ppm. The results for lead in subsurface soil samples at 6"- 12" ranged from 13 ppm to 2,700 ppm, the 12"- 18" interval ranged from 65 ppm to 11,000 ppm and the 18"- 24" interval ranged from 36 ppm to 5,400 ppm.

It is estimated that approximately 700 cubic yards of lead contaminated soil at the Terrell Homes property warrants excavation and transportation for disposal off-site.

**5. NPL Status**

The Site is not on the NPL, nor is it expected to be listed on the NPL.

**6. Maps, pictures and other graphic representations**

Please see figures in Appendix A attached to this Action Memorandum.

## Other Actions to Date

### 1. Previous actions

A Pre-CERCLIS screening form was completed by the New Jersey Department of Environmental Protection (NJDEP) for the Site on May 28, 2012. There have been no other removal activities taken by other government or private parties prior to this request.

### 2. Current actions

Soil samples collected from the playground area of the Terrell Homes on December 3-4, 2012 indicated that elevated levels of lead were found to be present in the surface soils (0-2' depth interval) of the playground. EPA mobilized to the Terrell Homes with ERRS on February 21, 2013 to install 6' high temporary chain link fencing around the playground portion of the property, restricting access to the lead contaminated soils. Signs were placed on the fencing warning residents to keep out of the fenced area.

Additional soil sampling performed May 15-16, 2013 within the grassy area immediately adjacent the community building and sprinkler park indicated that elevated concentrations of lead are present along the property line and extending approximately 25' onto the Terrell Homes property. EPA mobilized to the Terrell Homes with ERRS on May 13, 2013 to install 6' high temporary chain link fencing and restrict access to the grassy area adjacent the Community Building and recreation area within the northern portion of the property. This fencing is an extension of the original temporary fence placed around the playground area on February 21, 2013. All of the grassy areas on the northern boundary of the Terrell Homes have now been fenced off. A swing gate was installed on the fencing across the cement driveway to allow access for maintenance staff to receive deliveries to the basement of the building at 35 Riverview Court. A key to the chained gate was provided to the NHA property manager and the supervisor of the maintenance staff at Terrell Homes. Signs were placed on the fencing warning residents to keep out of the fenced area.

There are no other current or on-going removal activities being taken by other agencies or private parties.

## State and Local Authorities' Roles

### 1. State and local actions to date

On February 19, 2013, EPA met with representatives from the Newark Housing Authority to discuss actions to be taken to restrict access to the playground area until a removal action could be taken. NHA removed the play equipment from the area on February 20, 2013 to discourage residents from utilizing the playground area and granted EPA access to install a temporary chain-link fence restricting access.

After receiving the soil sampling results from the March/April EPA soil sampling event at the Terrell Homes property, the Newark Housing Authority erected a temporary construction fence on May 9, 2013, restricting access to the unpaved grassy area adjacent the Community Building and sprinkler park. The construction fence was a temporary measure until EPA could mobilize and install a temporary chain link fence restricting access to this portion of the property.

The Newark Department of Child and Family Well-Being in conjunction with the University of Medicine and Dentistry of New Jersey (UMDNJ) conducted blood lead screenings on children up to the age of 12 at the Terrell Homes Community Building in response to the elevated lead concentrations present in the playground area of the housing complex. No elevated blood lead results were reported as a result of this screening event which was conducted on April 2, 2013.

**2. Potential for continued State/local response**

The NJDEP has been notified of the conditions that exist at the Barth Smelting Corporation Site and that soils exceeding the NJDEP Residential Direct Contact Soil Remediation Standard may be left in place at depth. A deed notice may be required to ensure that the removal action selected remains protective. NJDEP would be responsible for ensuring the long term effectiveness of the deed notice, should it be required.

## III. THREATS TO PUBLIC HEALTH OR WELFARE, OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

The contaminant identified at the Site is lead which is a hazardous substance as defined by Section 101(14) of CERCLA and is listed in 40 CFR, Table 302.4. Analytical data from samples collected at the Terrell Homes residential complex indicate that lead is present in the surface and subsurface soils at concentrations greater than the removal action level of 400 ppm.

Lead is a cumulative poison where increasing amounts can build up in the body eventually reaching a point where symptoms and disability occur. Particularly sensitive populations include children and pregnant women, because of the fetal transfer of lead. Cognitive deficits are associated with fetal and childhood exposure to lead. An increase in blood pressure is the most sensitive adverse health effect from lead exposure in adults. Effects of kidney, nervous system, and heme-forming elements are associated with increasing blood lead concentrations, both in children and adults. Other symptoms include decreased physical fitness, fatigue, sleep disturbance, aching bones, abdominal pains and decreased appetite.

Children under the age of six are especially vulnerable to lead poisoning, which can severely affect mental and physical development. Ingestion is the most common route of exposure to lead for children. In children, there is a wide range of neurological effects associated with lead exposure, some of which may be irreversible. Exposure to lead causes diminution in brain function and reduction in achievement that lasts throughout life. Some studies have found that for every 10 µg/dl increase in blood lead level, a child's intelligence quotient (IQ) was found to decrease by four to seven points. Some of the neurological effects of lead in children may persist well into adulthood; early exposures have been linked in several studies to increased rates of hyperactivity, inattentiveness, failure to graduate from high school, conduct disorder, juvenile delinquency, drug use, and incarceration.

The relationship between soil lead concentrations and the consequent impact on blood levels in children has been studied through numerous epidemiological studies. Based on these epidemiological studies, it is generally believed that persistent exposure to soil-born lead results in an increase in blood lead levels (in children) of 1 to 9 ug/dl per 1,000 ppm lead in soil. Although this relationship may become less

significant as exposure durations decrease and soil lead levels increase, it nonetheless provides compelling evidence of the potential lead hazard associated with the excessive lead concentrations found in soil at the Site.

Conditions at the Site meet the requirements for implementation of a CERCLA removal action at the Site. The potential release for hazardous substances from the Site present a threat to the public health and welfare as defined by Section 300.415(b) (2) of the NCP.

**Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants**

Direct contact with the elevated levels of lead in soil may occur through common outdoor activities that occur on the residential property, or by tracking lead contaminated dirt inside the home. Contact with the lead contaminated soils may present a health risk to the residents, particularly young children. Both areas of the Terrell Homes property where elevated levels of lead exist, the sprinkler park and the former playground, cater to children. Children accessing these areas of the Terrell Homes could potentially be exposed to high levels of lead present in soil.

**High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate**

Analytical data indicates that elevated levels of lead have been detected in the top two feet of soil at the playground and sprinkler park areas of the Terrell Homes. Lead has been detected in the soil at concentrations as high as 8,920 mg/kg at the 12-18" depth interval and in the top one inch of soil at concentrations as high as 6,030 mg/kg. The lead-containing soil at the housing complex can potentially become airborne and/or migrate when disturbed under dry conditions; and may migrate during heavy rain events or storm events.

**Weather conditions that may cause hazardous substances, or pollutants, or contaminants to migrate or be released**

Weather conditions may cause lead on the Site to migrate particularly through surface water run-off from precipitation and/or storm surge. The analytical data suggests that lead contamination has migrated outside the historical footprint of the former Barth Smelting Corporation facility onto the adjoining property perhaps through erosion, surface water runoff during rainfall events, storm surges, or earth moving activities.

Storm surges, like the one observed during Hurricane Sandy, could potentially cause contaminated soils in the playground and sprinkler areas at the Terrell Homes to migrate to other areas of the property or even inside residential units. These same storm surges could potentially aggravate the erosion of soil along the property line beneath the cap on the 99 Chapel Street property potentially causing the migration of contaminated soils onto the Terrell Homes property.

**The availability of other appropriate federal or State response mechanisms to respond to the release**

EPA is the only governmental agency capable of taking a timely and appropriate action to respond to the threat posed by the presence of lead in soil at the Site.

## IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances from the Site, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

## V. EXEMPTION FROM STATUATORY LIMITS

Conditions at the Site meet the criterion for an exemption from the statutory time limitation.

### A. Emergency Exemption:

Section 104 (c)(1) of CERCLA, as amended, limits Federal emergency response to 12-months and $2 million, unless the criteria are met for an emergency exemption. The immediate risks to human health, welfare and the environment posed by the lead-contaminated soil found at the Site warrant the 12-month exemption as follows:

**1. There is an immediate risk to public health, or welfare, or the environment**

Lead identified in the top foot of soil at concentrations as high as 7,130 ppm poses the risk of direct contact for residents of the area. Exposure to lead is likely, through routine play and outdoor recreational activities. The potential for increased exposure to lead exists and is a health concern when children place their hands or other objects covered with lead contaminated dust/soil into their mouth. The threat is increased when bare soil is present.

**2. Continued response actions are immediately required to prevent, limit or mitigate an emergency; and**

The elevated levels of lead pose a public health threat to anyone who may come in contact with contaminated soil on the residential properties. Lead levels in soils were detected as high as 6,030 ppm at the 0"- 1" depth interval and 7,130 ppm at the 1"- 6" depth interval. Failure to complete the recommended response action would result in a continuing health threat to the children and the residents within the housing complex as well as visitors.

**3. Assistance will not otherwise be provided on a timely basis.**

There are no other federal, state or local government entities with sufficient resources to accomplish the required removal activities.

## VI. PROPOSED ACTIONS AND ESTIMATED COSTS

### A. Proposed Actions

### 1. Proposed action description

The objectives of the removal action at the Site are as follows:

- Prevent the human exposure to lead in the residential area through direct dermal contact with and incidental ingestion of soil; and
- Prevent the potential migration of lead in soil at the Site to adjacent residential play areas and waterways.

The following activities will be implemented to achieve the removal action objectives for the Site.

- Prepare work plans including: Health and Safety Plan, Work Plan, Quality Assurance Project Plan, and Community Air Monitoring Plan;
- Obtain Access Agreements;
- Setup support areas: Command Post, break/security trailers, parking and soil staging areas;
- Conduct a landscape inventory of the Terrell Homes property and document existing conditions prior to removal activities;
- Review existing property sketches to confirm location of features that may be disturbed by the removal action;
- Remove trees, shrubs and fencing as necessary for removal of contaminated soil;
- Design and construction of erosion control measures, as necessary to prevent lead-contaminated soil from the 99 Chapel Street property portion of the Site to migrate onto adjacent unpaved play areas,
- Implement measures to eliminate direct contact with lead contaminated surface soils and to prevent the migration of lead contaminated soil via erosion,
- Excavate lead-contaminated soil from the grassy play areas on the Terrell Homes property identified as a result of previous delineation samplings. Soil will be removed until the site cleanup criterion of 400 ppm on residential properties is attained or to a maximum depth of one foot below grade;
- Areas under paved surfaces, such as driveways, sidewalks, concrete aprons and within the footprint of the apartment complex will not be excavated. Excavation will be limited in depth to one foot and to areas that will not compromise the structural integrity of permanent structures;

- Conduct fence line air monitoring for particulates during soil removal activities to determine the effectiveness of dust suppression;

- Collect post-excavation confirmatory samples;

- Backfill excavated area to approximately six inches below pre-excavation grades. A minimum of six inches of topsoil materials will be placed on top of the backfill in the excavated areas;

- Restore impacted areas to pre-existing grade and pre-construction conditions;

- Characterize, remove and dispose lead contaminated soil. Contaminated soil will be segregated according to its hazardous/non-hazardous character, loaded and transported off-site for disposal at a facility which complies with the EPA Off-Site Rule;

- Demobilize following the completion of the removal and restoration activities.

Post-removal site control activities may be required for this removal action. Lead contaminated soil will be excavated from unpaved areas on the residential housing complex to a depth of one foot; however, lead contaminated soil may be left in place beneath the one foot of clean cover that may require a deed notice.

**2. Contribution to remedial performance**

The response measures proposed in this Action Memorandum will address the threat of direct contact to lead by the public. The proposed action will contribute to any long-term remedial action with the respect to the release or threatened release of hazardous substances at the Site.

**3. Description of alternative technologies**

Because of the quantity of lead contaminated soil at the Site, on-site treatment and/or incineration is not appropriate. The selected removal/disposal of lead contaminated soil has been determined to be the appropriate response action for the Site based on the criteria of effectiveness, timeliness, and cost.

**4. Engineering Evaluation/Cost Analysis (EE/CA)**

Due to the time-critical nature of this removal action, an EE/CA will not be prepared.

**5. Applicable or relevant and appropriate requirements (ARARs)**

ARARs within the scope of this removal action will be met to the extent practicable, considering the exigencies of the situation. Federal ARARs determined to be applicable for the proposed scope of work include those in the Occupational Safety and Health Act, RCRA waste classification, storage and disposal requirements, and the Department of Transportation shipment requirements. Additional ARARs will be evaluated prior to the initiation of this action. New Jersey State ARARs will be identified and considered to the extent practicable.

### 6. Project schedule

At this time, two properties have been identified which warrant soil remediation. EPA is currently in the process of obtaining access to conduct the removal action from all property owners. The proposed removal activities can be implemented immediately upon receipt of access and approval of this Action Memorandum. Although removal of contaminated soil and backfilling of excavation is expected to be completed within six weeks of the start of construction, this project could take up to nine months to complete should restoration be delayed due to winter weather.

## B. Estimated Costs

The estimated costs for the completion of this project are summarized below. A detailed confidential Independent Government Cost Estimate is also included as Appendix C.

| Direct Extramural Costs | Funding Authorized for RV1 3/27/2013 | Funding Authorized for RV2 7/23/2013 | Current Funding Requested | Total Site Ceiling |
|---|---|---|---|---|
| Regional Removal Allowance Costs (Cleanup Contractor Costs including contingency) | $ 10,000 | $ 35,000 | $ 704,000 | $ 749,000 |
| Other Extramural Costs (RST, CLP) | $ 5,000 | $ 15,000 | $ 125,000 | $ 145,000 |
| Subtotal, Extramural Costs | $ 15,000 | $ 50,000 | $ 829,000 | $ 894,000 |
| 20% Extramural Cost Contingency | $ 0 | $ 0 | $ 166,000 | $ 166,000 |
| Total Direct Extramural Costs | $ 15,000 | $ 50,000 | $ 995,000 | $1,060,000 |

## VII. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Should the proposed actions described in this Action Memorandum not be implemented; the exposure threats posed by the lead will persist. Delayed action will increase the potential for exposure to elevated levels of lead on the residential complex. Migration of the lead contaminated soils could occur over time increasing the overall extent of the cleanup.

## VIII. OUTSTANDING POLICY ISSUES

There is no known outstanding policy issues associated with the Site at the present time.

## IX. ENFORCEMENT

Enforcement efforts to date have not identified viable potentially responsible parties that can perform the proposed response action for reimburse EPA for the cost of the clean up. These efforts will continue.

Based on full cost accounting practices, the total EPA costs for this removal action that will be eligible for cost recovery are estimated to be $1,457,000. The following chart describes the costs which EPA believes are eligible for cost recovery as part of this response action.

| Cost Type | Funding Requested in this Action Memorandum |
|---|---|
| Direct Extramural Costs | $ 995,000 |
| Direct Intramural Costs | $ 100,000 |
| Subtotal, Direct Costs | $1,095,000 |
| Indirect Costs (Indirect Regional Cost Rate (33.08%) | $ 362,000 |
| Estimated EPA Costs Eligible for Cost Recovery | $1,457,000 |

Note: Direct costs include direct extramural costs and direct intramural costs. Indirect costs are calculated based on an estimated indirect cost rate expressed as a percentage of site-specific direct costs, consistent with the full cost accounting methodology effective October 1, 2004. These estimates do not include pre-judgment interest, do not take into account other enforcement costs, including Department of Justice costs, and may be adjusted during the course of a removal action. The estimates are for illustrative purposes only and their use is not intended to create any rights for responsible parties. Neither the lack of a total cost estimate nor deviation of actual costs from this estimate will affect the United States' right to cost recovery.

## X. RECOMMENDATION

This decision document represents the selected removal action for the Barth Smelting Corporation Site in Newark, Essex County, New Jersey, developed in accordance with CERCLA as amended, and is not inconsistent with the NCP. This decision document is based on the Administrative Record for the Site.

Conditions at the Site continue to meet the NCP Section 300.415(b)(2) criteria for a removal action and I recommend your approval of this Action Memorandum. The costs of the removal action proposed in this Action Memorandum, including contingency costs, will increase the total project ceiling by $995,000 of which $704,000 is for mitigation contracting. The new total project ceiling for the Site, if approved, will be $1,060,000 with a mitigation ceiling of $749,000. There are sufficient monies in our current Advise of Allowance to fund this project.

Please confirm your approval of the removal action and 12-month exemption proposed for the Barth Smelting Corporation Site, as per the current Delegation of Authority, by signing below.

Approved: _____ Date: Sept. 26, 2013

Walter E. Mugdan, Director
Emergency and Remedial Response Division

Disapproved: _____ Date: _____

Walter E. Mugdan, Director
Emergency and Remedial Response Division

cc: (after approval)

G. Pavlou, DRA
W. Mugdan, ERRD-D
J. LaPadula, ERRD-DD
J. Rotola, ERRD-RAB
E. Wilson, ERRD-RAB
B. Grealish, ERRD-RAB
C. Petersen, ERRD-NJRB
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L. Rosman, NOAA
D. Kluesner, PAD
S. Kelley, PAD
P. Dillon, Newark Health
S. Bryant, Newark Health
K. Kinnard, NHA
E. Harris, NHA
A. Martin, NHA
J. Abrahams, NHA

**Figure 1**


## Legend

Site Location

0 0.075 0.15 0.3 0.45 0.6 Miles

**Weston Solutions, Inc.**
**Northeast Division**

In Association With
H & S Environmental, Inc.,
Scientific and Environmental Associates, Inc.
and Avatar Environmental, LLC.

**Figure 1**
**Site Location Map**

**Barth Smelting Corporation Site**
**Newark, New Jersey**

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMOVAL SUPPORT TEAM 2
CONTRACT # EP-W-06-072

| | |
|---|---|
| GIS ANALYST: | T. BENTON |
| EPA OSC: | K. STAIGER |
| RST SPM: | S. SNYDER |
| FILENAME: | SITEMAP.MXD |

DATE MODIFIED: 1/26/2012

**Figure 2**

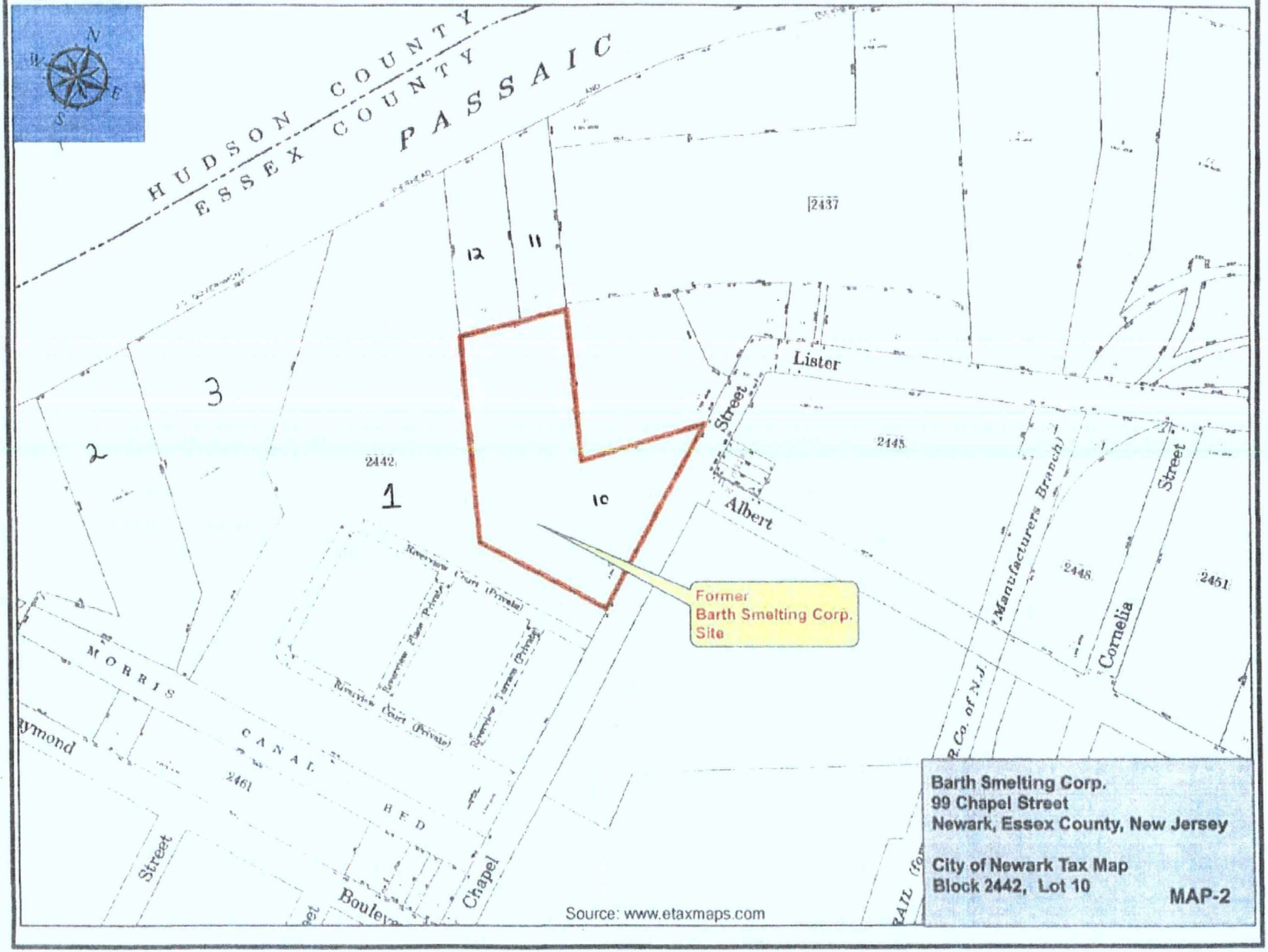

HUDSON COUNTY
ESSEX COUNTY
PASSAIC
2437
12
11
3
2
2442
1
10
Lister
Street
2445
Albert
Manufacturers Branch)
2448
2451
Cornelia
Street
Former
Barth Smelting Corp.
Site
MORRIS
CANAL
2461
Street
Chapel
Source: www.etaxmaps.com
Barth Smelting Corp.
99 Chapel Street
Newark, Essex County, New Jersey
City of Newark Tax Map
Block 2442, Lot 10
MAP-2

**Figure 3**


2007 aerial photograph

N
W E
S

0 100 200 400 600 Feet

**Barth Smelting Corp.**
**99 Chapel Street**
**Newark, Essesx County, New Jersey**

**MAP-1**

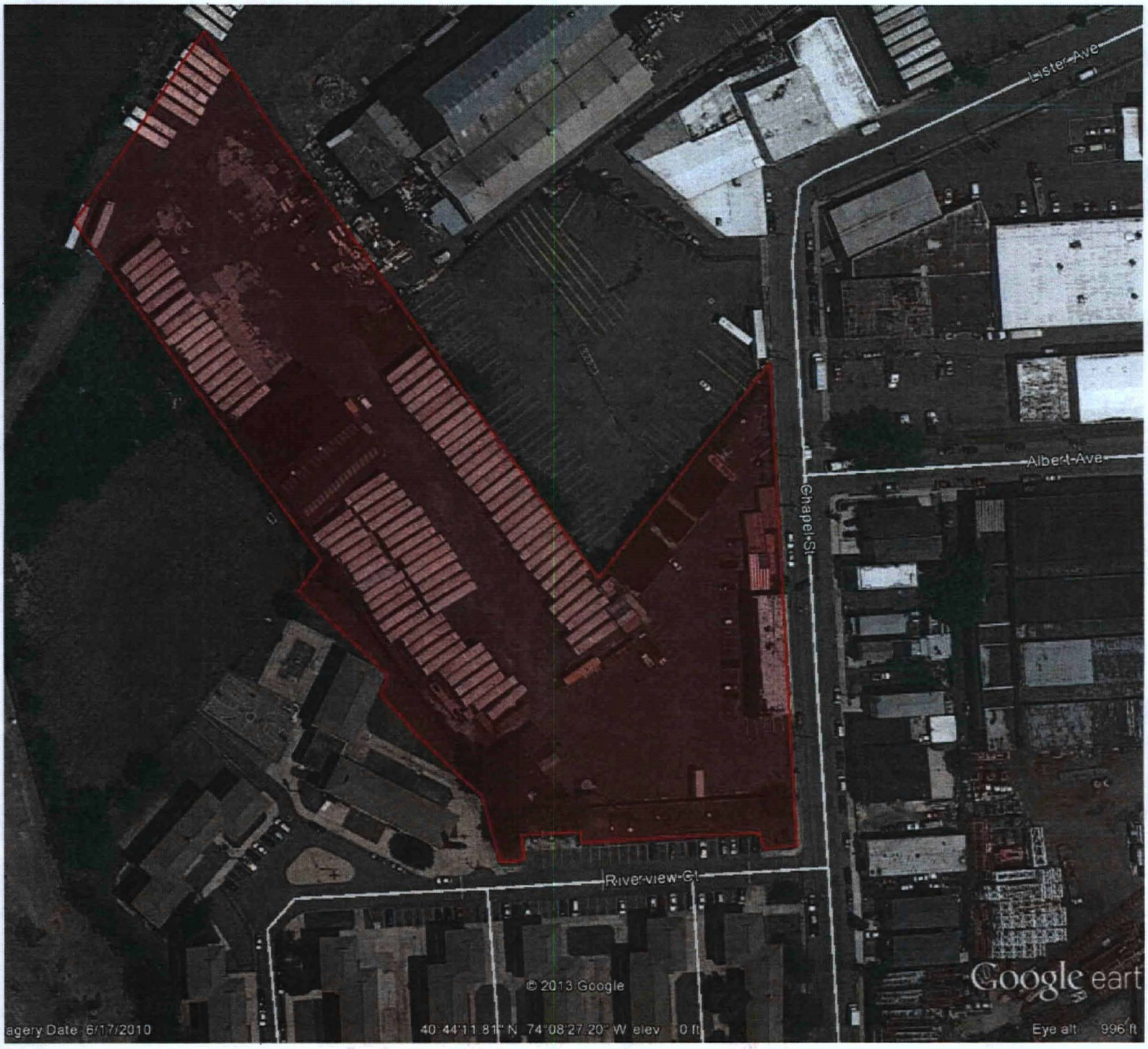
# Appendix A
1

Historic footprint of New Jersey Zinc outlined in yellow

- Barth Smelting operated on a small parcel that was formerly part of the New Jersey Zinc operations

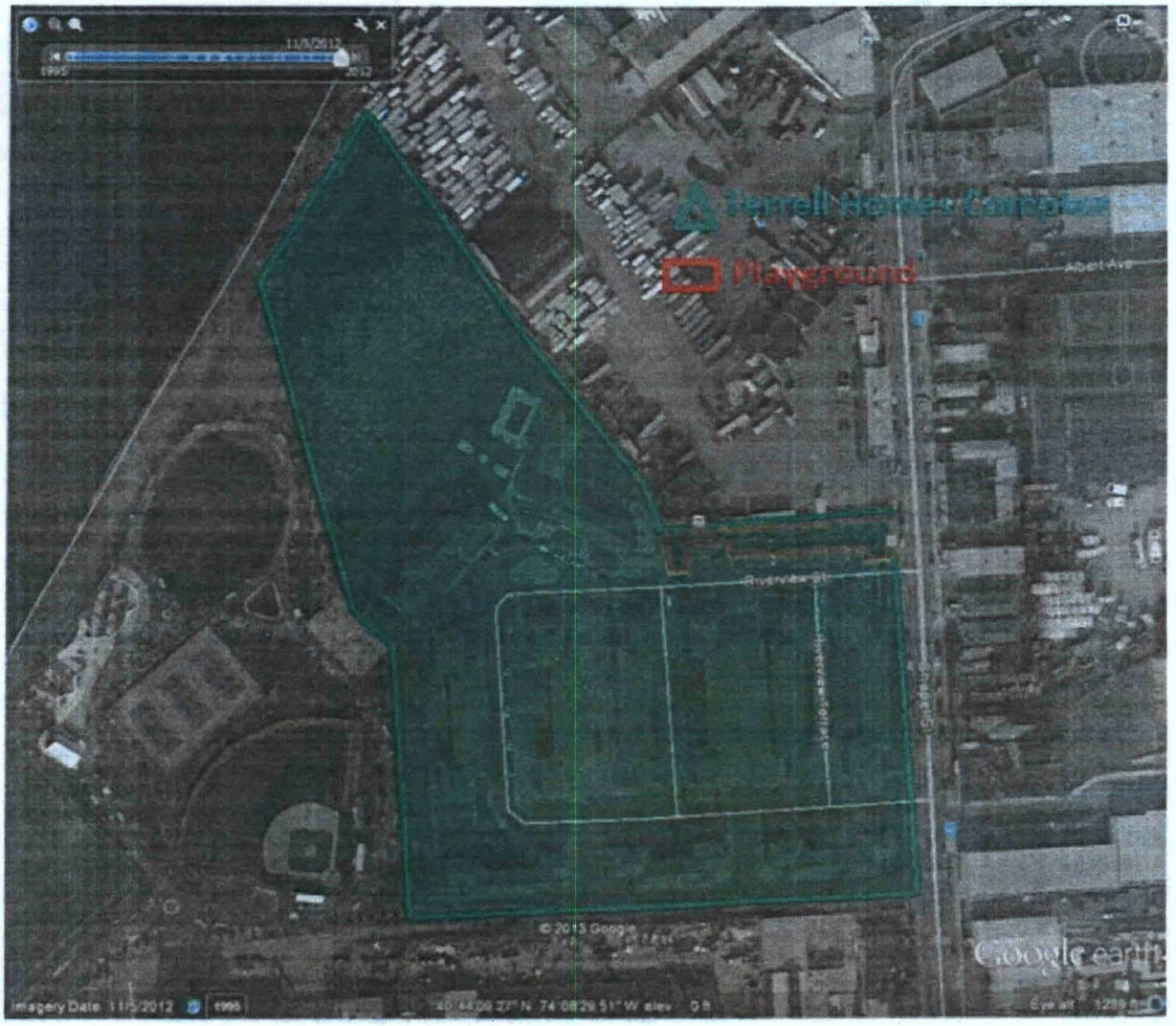
# Appendix A
# 2

- Shaded red area represents the Barth Smelting Site



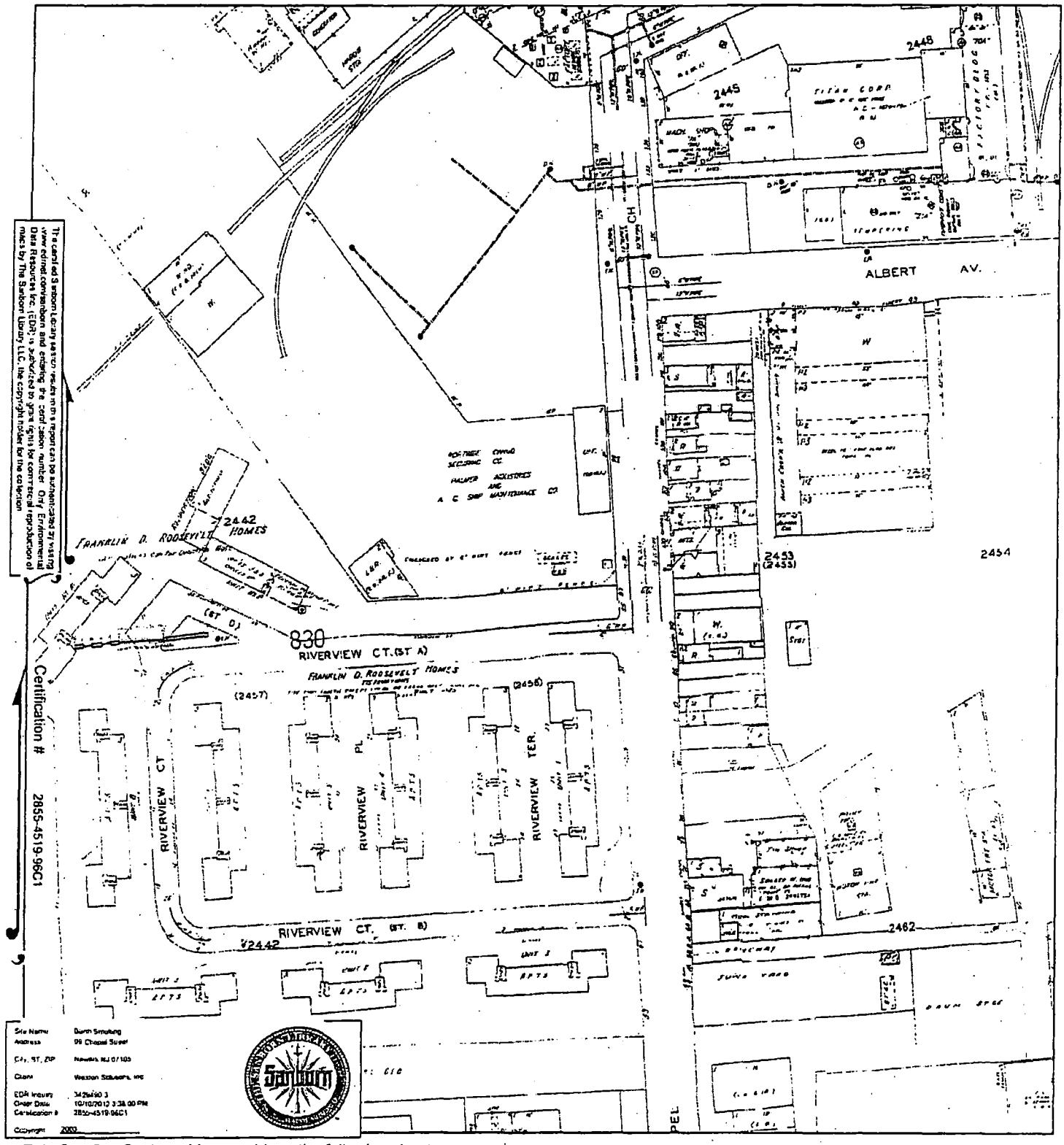
# Appendix A
3

Footprint of Terrell Homes property
Former playground area outlined in red



# Appendix B

# 2003 Certified Sanborn Map




Certification # 2855-4519-96C1

| | |
|---|---|
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| Address | 99 Chapel Street |
| City, ST, ZIP | Newark, NJ 07103 |
| Client | Weston Solutions, Inc |
| EDR Inquiry | 3429490.3 |
| Order Date | 10/10/2012 3:38:00 PM |
| Certification # | 2855-4519-96C1 |
| Copyright | 2003 |

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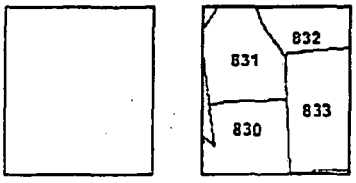
Outlined areas indicate map sheets within the collection.

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Volume 8, Sheet 832
Volume 8, Sheet 833

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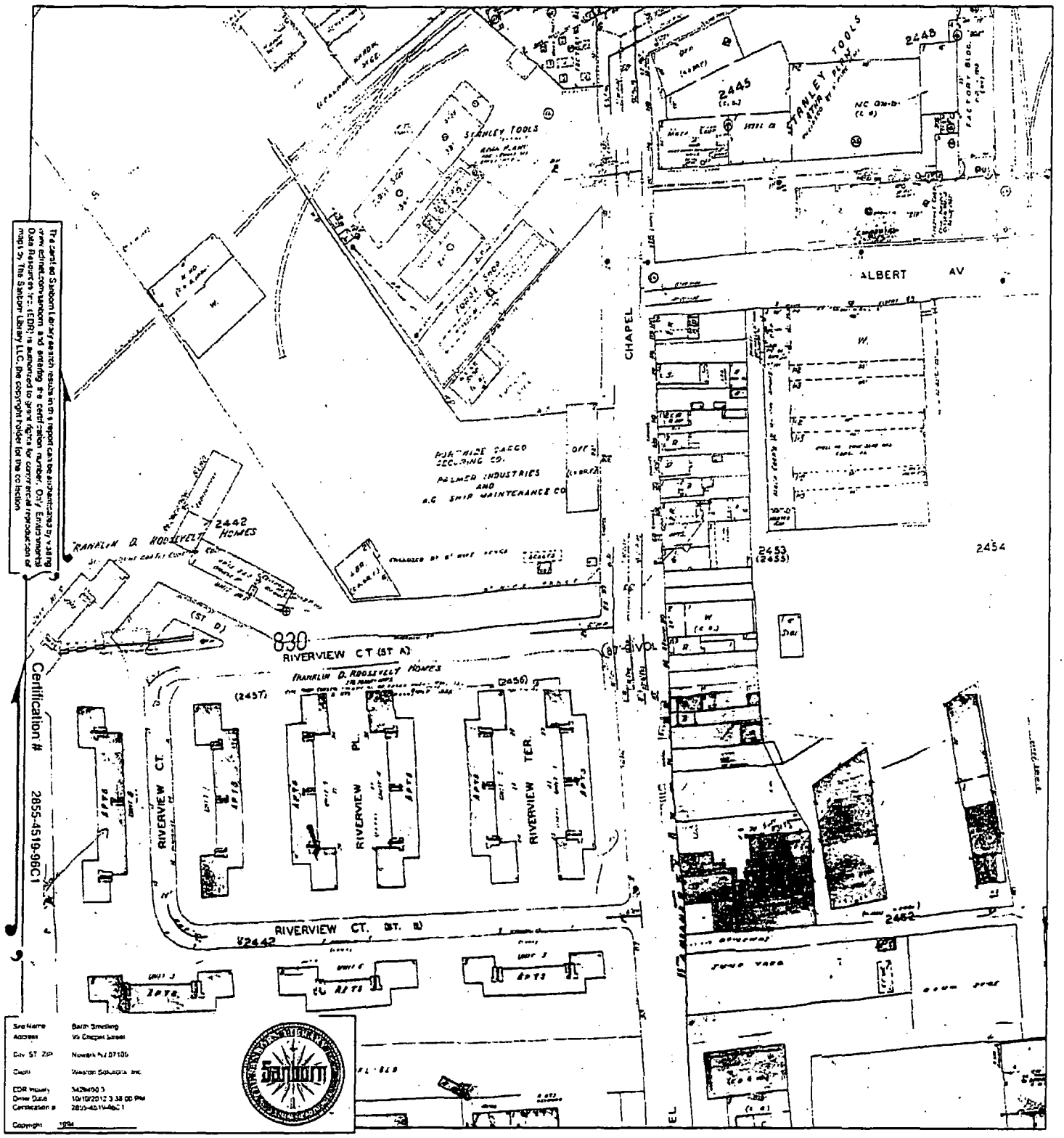


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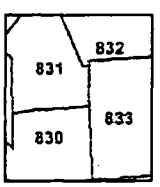


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Volume 8, Sheet 833
Volume 8, Sheet 830

Volume 8, Sheet 831
Volume 8, Sheet 832
Volume 8, Sheet 833

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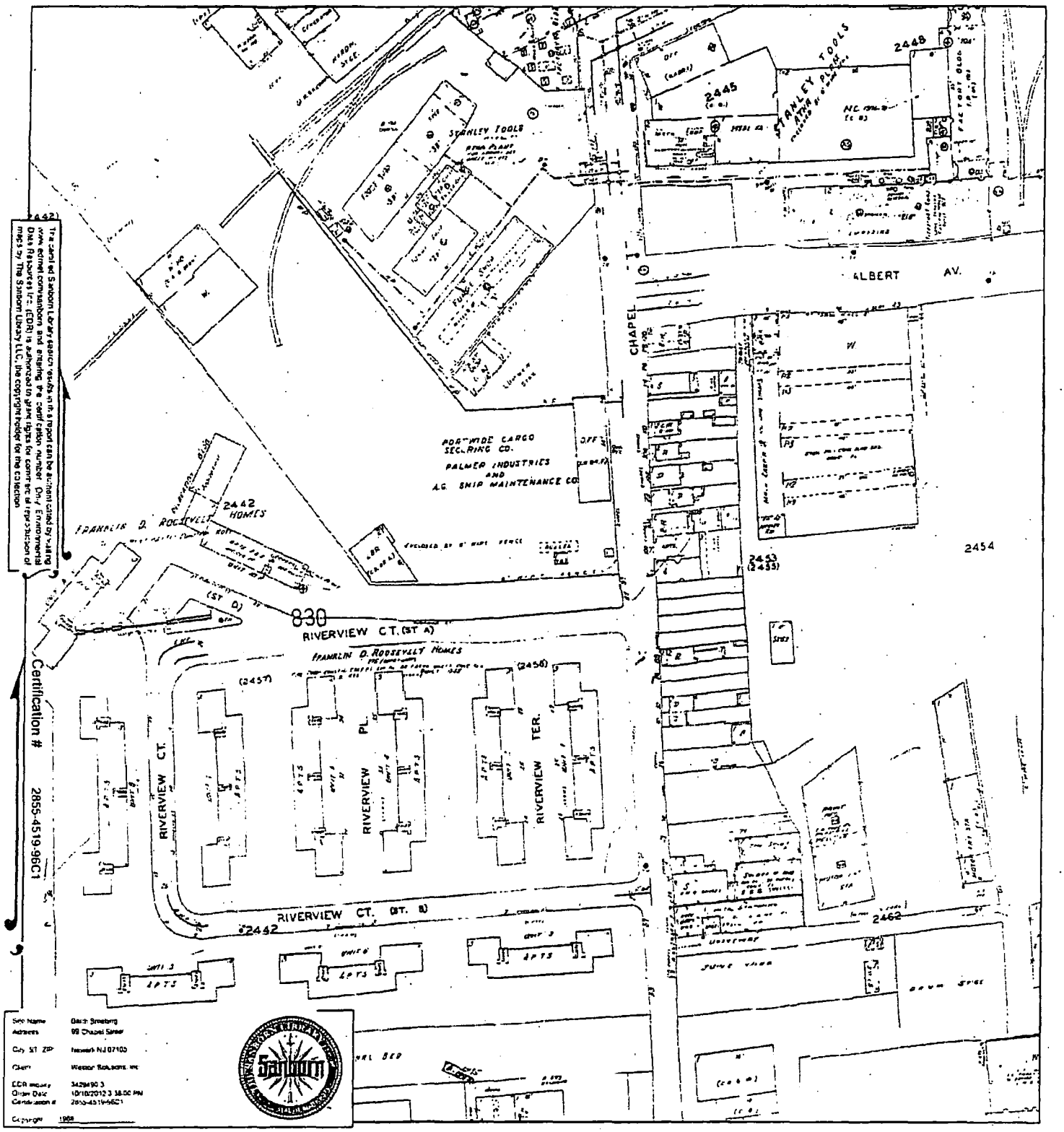


Certification # 2855-4519-96C1

| | |
|---|---|
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| Address | 99 Chapel Street |
| City ST ZIP | Newark NJ 07103 |
| Client | Weston Solutions, Inc |
| EDR Inquiry | 3429490.3 |
| Order Date | 10/10/2012 3:38:00 PM |
| Certification # | 2855-4519-96C1 |
| Copyright | 1988 |

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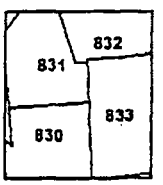


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Volume 8, Sheet 833

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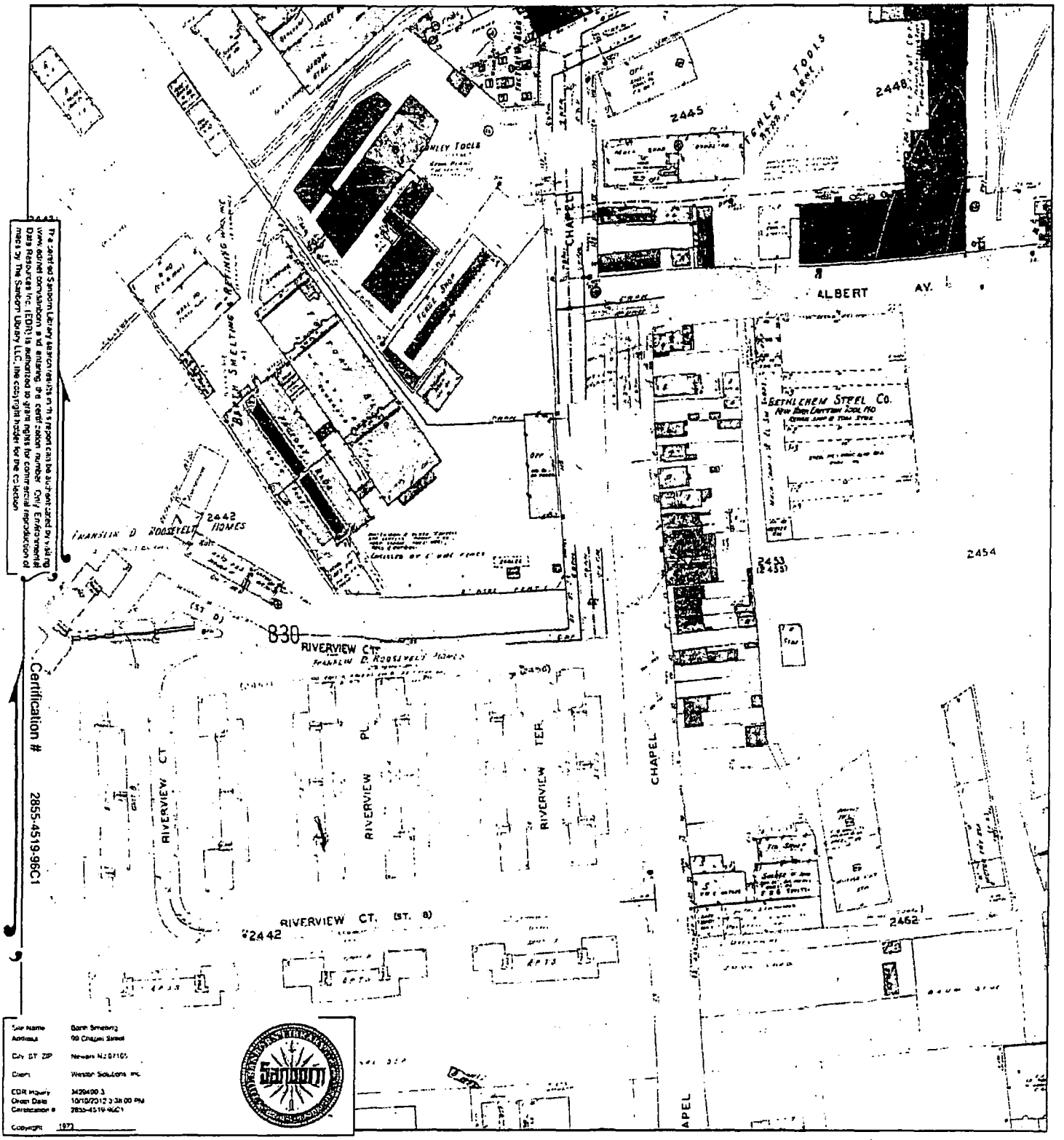




Certification # 2855-4519-96C1

Site Name: Bonn Smelting
Address: 90 Chapel Street
City ST ZIP: Newark NJ 07105
Client: Weston Solutions, Inc.
EDR Project: 3429490.3
Order Date: 10/10/2012 3:38:00 PM
Certification #: 2855-4519-96C1
Copyright: 1973

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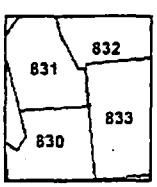


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Volume 8, Sheet 832
Volume 8, Sheet 833

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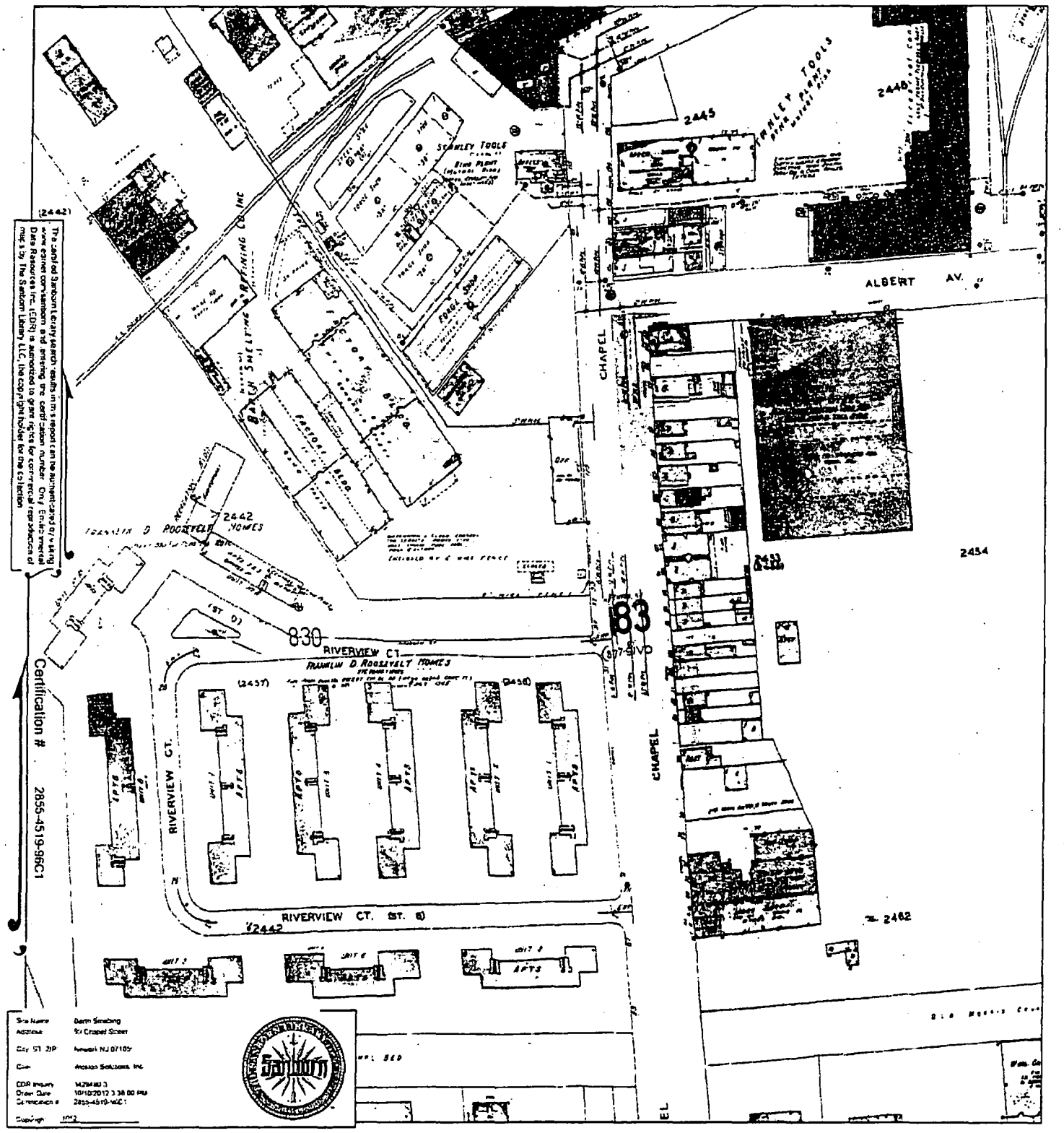


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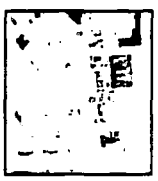

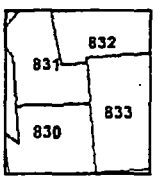


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Volume 8, Sheet 833

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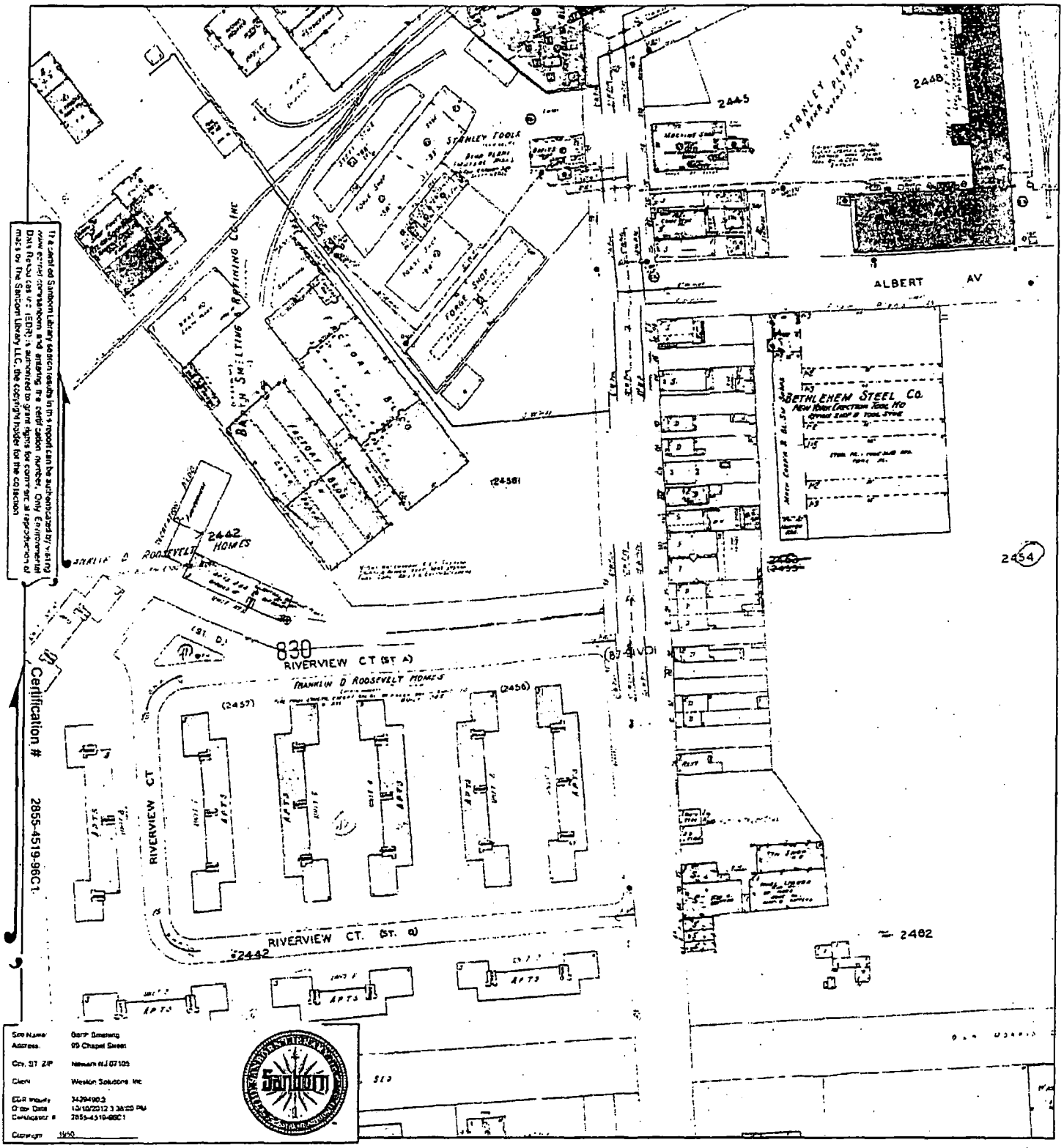




Certification # 2855-4519-96C1

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City, ST, ZIP: Newark, NJ 07105
Client: Weston Solutions, Inc.
EDR Inquiry: 3429490.3
Order Date: 10/10/2012 3:38:20 PM
Certification #: 2855-4519-96C1

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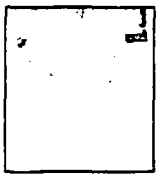

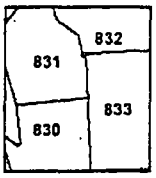


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Volume 8, Sheet 832
Volume 8, Sheet 833

0 Feet 150 300 600

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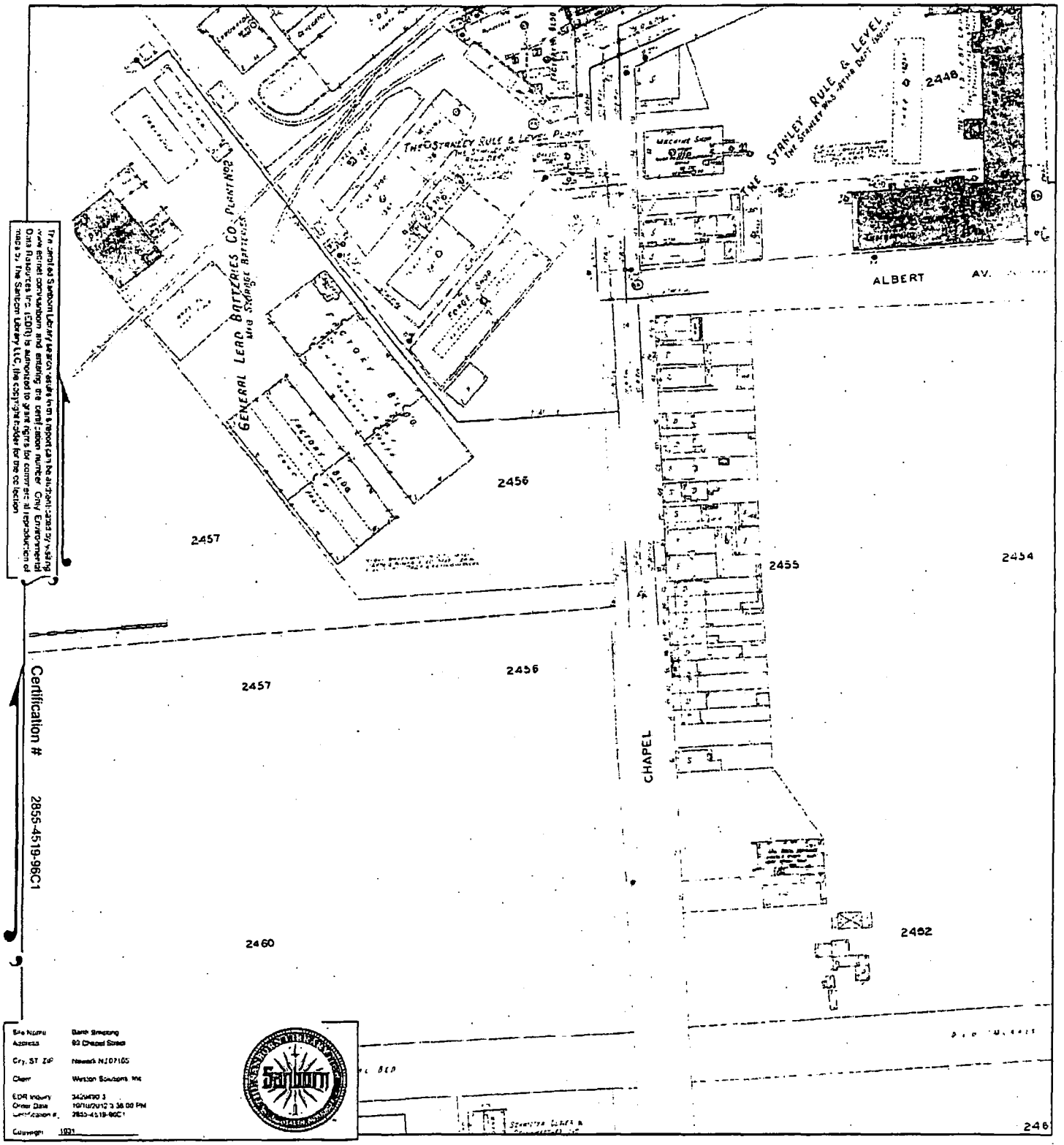


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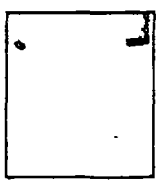

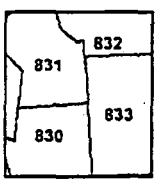


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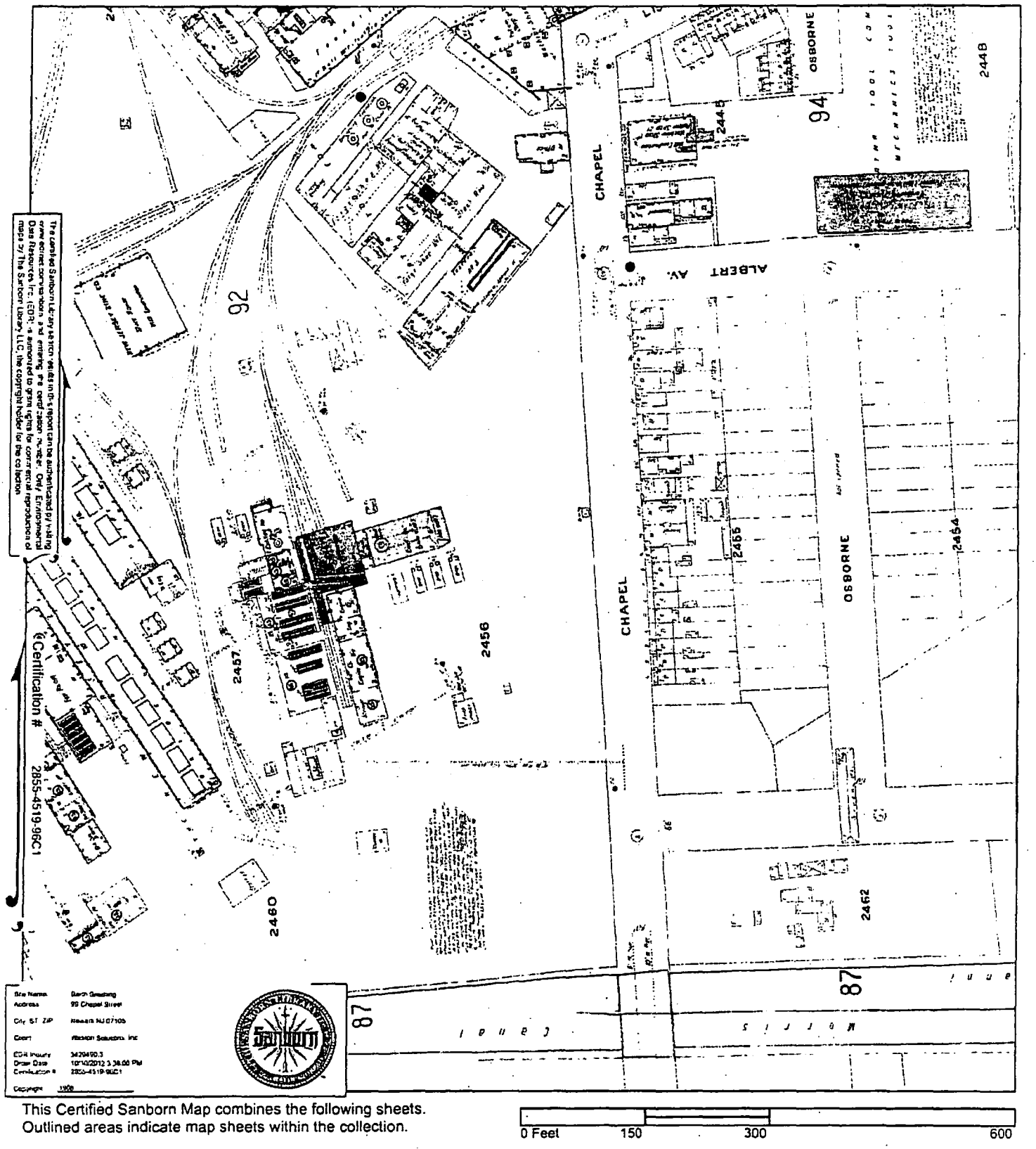


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| | |
|---|---|
| Site Name | Bench Greetings |
| Address | 99 Chapel Street |
| City ST ZIP | Newark NJ 07105 |
| Client | Weston Solutions, Inc |
| EDR Inquiry | 3429490.3 |
| Order Date | 10/10/2012 3:38:00 PM |
| Certification # | 2855-4519-96C1 |
| Copyright | 1908 |

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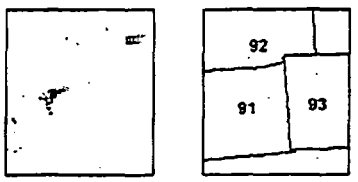


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Volume 1, Sheet 93

0 Feet 150 300 600

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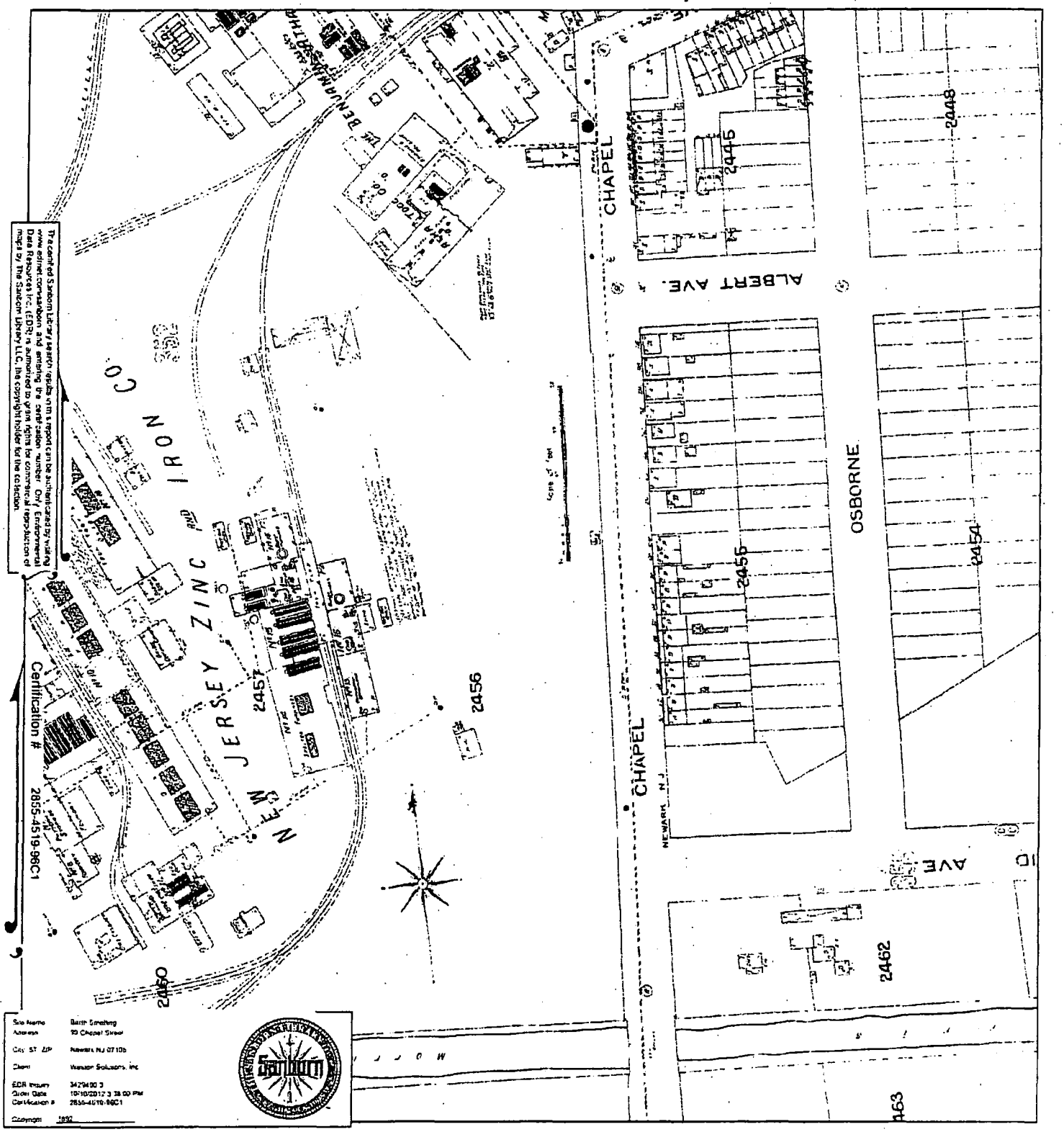


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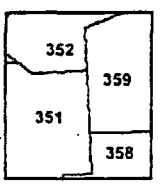



Volume 4, Sheet 351
Volume 4, Sheet 352
Volume 4, Sheet 358
Volume 4, Sheet 359

0 Feet 150 300 600

N

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION II**

**DATE:** AUG 0 9 2013

**SUBJECT:** Removal Site Evaluation for the Barth Smelting Corporation Site, Newark, Essex County, New Jersey

**FROM:** Kimberly Staiger, On-Scene Coordinator
Removal Action Branch

**TO:** Joseph D. Rotola, Chief
Removal Action Branch

**SITE ID:** A22L **CERCLIS#:** NJN008010373

## I. INTRODUCTION

In September 2012, the United States Environmental Protection Agency (EPA) began an evaluation of the Barth Smelting Corporation Site (Site) in Newark, New Jersey for a Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) removal action.

The Site is a former secondary copper smelting facility that also produced brass and bronze ingots and worked with non-ferrous metals. Prior operators at the site property include General Lead Batteries, a manufacturer of lead acid batteries, and the New Jersey Zinc Company, a former zinc smelter. The Site has since been sold and is now currently home to a maritime cargo securing company. A playground and residential dwellings now located on and adjacent to the Site are of particular concern for this removal site evaluation (RSE).

Soil sampling conducted by EPA as part of the RSE indicates there has been a release of lead, a CERCLA-designated hazardous substance, at the Site that poses a substantial threat to the public health and the environment, particularly to the residential child-aged population. Based on the available information, a time-critical CERCLA removal action is warranted to address lead contamination in soils at the Site.

## II. SITE CONDITIONS AND BACKGROUND

### A. Site Description

#### 1. Physical location

The former Barth Smelting Corporation was located at 99 Chapel Street, Newark, New Jersey (see Figure 1). The Site includes the historic footprint of the former Barth Smelting Corporation facility (Block 2442, Lots 10, 11, 12) and the extent of lead contamination adjacent to the former facility, including a playground and grassy area adjacent to the community building on the Newark Housing Authority (NHA) Terrell Homes property located at 59-97 Chapel Street (Block 2442, Lot 1) (see Figure 2). Maps indicating the site boundaries are included in Appendix A.

The Site is located in a mixed residential/industrial neighborhood within the Ironbound Section of Newark, Essex County, New Jersey. The Site is bounded to the north and west by the Passaic River and the Essex County Riverfront Park and to the east by Chapel Street. The southern portion of the Site is located in the Terrell Homes, a low income residential housing complex operated by the NHA.

The Ironbound Section of Newark is the most densely populated neighborhood in a densely populated city, with housing stock mostly consisting of multi-story tenements and row homes. The Ironbound consists of four square miles within the East Ward of Newark and is bounded geographically by the Passaic River, the Newark Liberty International Airport, and Newark Penn railroad station. This neighborhood in Newark is a recognized Environmental Justice community with many disadvantages including poverty and crime.

#### 2. Site history

The New Jersey Zinc & Iron Company, also known as the Newark Zinc Works, formerly operated on the properties now occupied by 99 Chapel Street Partners, the Newark Housing Authority's Millard E. Terrell Homes (Terrell Homes), and Essex County Parks Department (see Figure 3). The Zinc Works was one of the first commercial zinc oxide plants in the United States and operated on this location from 1848 to 1910. When New Jersey Zinc and Iron Company closed, the buildings were demolished. At some point after the closure of New Jersey Zinc, the property was sub-divided into five lots (Block 2442, Lots 1, 3, 10, 11, and 12) and was acquired by various parties.

In the 1930's, General Lead & Battery, a manufacturer of lead acid batteries, operated on Block 2442, Lots 10, 11, 12 (generally identified as 99 Chapel Street) that were formerly owned by New Jersey Zinc & Iron Company. From 1946 to 1982, Barth Smelting Corporation operated on the same three lots producing brass and bronze ingots and non-ferrous metals and alloys. Barth Smelting was listed as an unrecognized battery lead smelter site in a paper titled "Discovering Unrecognized Lead Smelting Sites by Historical Methods" written by William Eckel et al, and published in the American Journal of Public Health, April 2001, however

several resources exist labeling Barth Smelting as a secondary copper smelting facility. Currently, Portwide Container, a cargo securing company, operates on this property. In 1946, the Millard E. Terrell Homes, a low-income family development with 275 units, were constructed at 59-97 Chapel Street (Block 2442, Lot 1), a property formerly occupied by the New Jersey Zinc & Iron Company. The residential public housing complex is currently home to 784 occupants. Occupancy of public housing at all Newark Housing Authority properties is dictated by income, with preferences for elderly, disabled and DYFS (Division of Youth and Family Services) referrals.

The portion of the New Jersey Zinc & Iron Co. facility which has a street address of Rear 59-97 Chapel Street (Block 2442, Lot 3) has been mostly used for industrial purposes, after operations at the zinc smelter ceased. The Standard Bitulithic Company owned and operated an asphalt plant on this property from 1919 until 1982. Palmer Industries purchased this property in 1982 for use as a ship container storage facility. At the time of purchase by Palmer Industries, the Site was undeveloped and remained undeveloped until the Essex County Improvement Authority (ECIA) claimed ownership of the property through eminent domain. The property has since been developed as a public park that opened on May 30, 2012, and includes a soccer field and a baseball field with synthetic grass surfaces, tennis and basketball courts, a passive meadow, walking paths, two playground areas, a sprinkler park and a small parking area along the waterfront.

Historic Sanborn Maps have been included in Appendix B.

## 3. Previous work relevant to this RSE

Between December 3 and 6, 2012, EPA's Region II Pre-Remedial Program collected soil samples from the playground area on the northern edge of the Terrell Homes property, from two residential properties situated across Chapel Street from the former Barth Smelting Corporation facility, and from two background locations. A total of 23 soil borings were installed across the playground area to a depth of two feet below ground surface (bgs). Two soil borings were installed in each residential backyard and two soil borings were installed in each background location. Five soil samples were collected from each soil boring at the following depth intervals: 0-1", 1-6", 6-12", 12-18", and 18-24" bgs. All soil samples were sent for laboratory analysis for Target Analyte List (TAL) metals plus mercury and tin.

The playground was divided into three areas according to use. The "immediate playground area" defined the area of the playground where play equipment was located, the "western playground area" is situated immediately behind the trash dumpsters to the west of the playground equipment, and the "eastern playground area" is where tenants of the Terrell Homes tend to gather, as evidenced by the lawn chairs noted beneath a tree near the fence line.

All three areas of the playground were found to have elevated levels of lead present within the surface soils (0-6" bgs depth interval) that exceeded EPA's residential soil screening level of 400 milligrams per kilogram (mg/kg). The highest lead concentration present in the playground was found at the 18-24" depth interval (8,920 mg/kg). A soil sample collected

from the eastern playground area had a lead concentration of 6,030 mg/kg in the 0-1" depth interval.

Elevated lead levels were also found in both Chapel Street residential backyards sampled. Concentrations of lead were found on the private residential properties ranging from 117 mg/kg to 8,770 mg/kg. The average lead concentrations at each depth interval (0-1", 1-6", 6-12", 12-18", and 18-24" bgs) was 743 mg/kg, 309 mg/kg, 2,492 mg/kg, 271 mg/kg, and 436 mg/kg, respectively.

Background soil samples were collected from Lincoln Park located at Broad Street and Clinton Avenue in Newark, and at the Redemptoris Mater Archdiocesan Missionary Seminary located in Kearny, New Jersey across the Passaic River in an upwind direction from the former Barth Smelting Corporation facility. Four soil borings were installed in the background locations; two in Lincoln Park and two in the Redemptoris Mater Seminary. Soil samples were collected from each boring at the following depth intervals: 0-1", 1-6", 6-12", 12-18", and 18-24" bgs. Soil samples collected from Lincoln Park had an average concentration of lead in the top 1" of soil of 587 mg/kg, with decreasing concentrations of lead found in the increasing depth intervals. All soil samples collected at the Seminary had concentrations of lead less than 400 mg/kg.

## 4. Site assessment activities/observations

### Terrell Homes

A small recreational playground utilized by the Terrell Homes residents is located immediately adjacent the former Barth Smelting facility on the northeastern portion of the Terrell Homes property. A concrete wall is situated along this property line. EPA soil sampling performed in December 2012 identified elevated levels of lead in the surface soils (0-2' depth interval) of the playground exceeding EPA's residential soil screening level of 400 mg/kg. The average concentration of lead in the soils at the one inch depth was 1,127 mg/kg. Lead concentrations ranged from 103 mg/kg to 8,920 mg/kg, with the highest concentration detected in the western grassy area behind the dumpsters in the 12-18" bgs depth interval.

On February 19, 2013, EPA met with representatives from the NHA to discuss actions to be taken to restrict access to the playground area. Terrell Homes had suffered significant water damage during the storm surge associated with Hurricane Sandy, and subsequent cleanup of the property depleted funding available for this property. EPA assistance was requested to install a temporary chain link fence to restrict access after the playground equipment was removed by the NHA on February 20, 2013.

On February 20, 2013, verbal authorization was received to conduct an emergency removal action at the Terrell Homes. Temporary six-foot high chain-link fencing was installed around the playground perimeter on February 21, 2013 to restrict access to the contaminated soils present in the playground area.

EPA returned to the Terrell Homes in the spring of 2013 to collect soil samples from the entire property in a 100 x 100' grid to determine if historic operations conducted adjacent to and on this property had impacted the soil. A total of 208 soil samples were collected from 39 soil borings installed throughout the Terrell Homes property from March 29 to April 1, 2013. Soil samples were collected from each boring at the following depth intervals: 0-1", 1-6", 6-12", 12-18", and 18-24" bgs. All soil samples collected were sent to a laboratory for TAL Metals plus mercury and tin analysis. The results of this soil sampling are documented in Weston Solutions, Inc.'s Final Soil Sampling Trip Report for the Barth Smelting Site – Property P002 (Terrell Homes), Newark, New Jersey dated July 29, 2013.

Lead concentrations exceeding EPA's residential soil screening level of 400 mg/kg were found within the top two feet of soil within a grassy area immediately adjacent to the community building which serves as a recreational area for the Terrell Homes residents and contains a basketball court and a sprinkler park area. The highest concentration of lead found in the top one inch of soil in this location during the March/April 2013 sampling event was 1,600 mg/kg.

On May 9, 2013, EPA met with representatives from the NHA to discuss the results of the March/April soil sampling event, and to determine interim measures that could be taken to restrict access to the grassy area next to the sprinkler park. Following this meeting, NHA installed a temporary construction fence around the grassy area to restrict access until a more permanent temporary fence could be erected. Six-foot temporary chain link fencing was installed by the EPA on May 13, 2013 around the grassy area next to the sprinkler park. This fencing was attached to the original fencing restricting access to the former playground. A swing gate locked with a chain and padlock was installed on the fencing across an access driveway at the rear of the building to allow access for delivery vehicles and maintenance staff.

Additional soil sampling was performed May 15-16, 2013 to characterize the nature and extent of the lead present in soils within the grassy area immediately adjacent the community building and sprinkler park. A total of 154 soil samples were collected from 31 soil borings installed in this area. Soil samples were collected from each boring at the following depth intervals: 0-1", 1-6", 6-12", 12-18", and 18-24" bgs. All soil samples collected were field screened with a portable X-Ray Fluorescence (XRF), with 15 soil samples (10%) sent for confirmatory lab analysis. Elevated concentrations of lead were found along the property line and extending approximately 25' onto the Terrell Homes property. The highest concentration of lead detected with the XRF was in the 6-12" depth interval at 2,330 mg/kg, and the highest concentration of lead in the top 1" of soil was 2,327 mg/kg. The results of this soil sampling are documented in Weston Solutions, Inc.'s Final Soil Sampling Trip Report for the Barth Smelting Site – Property P002 (Terrell Homes), Newark, New Jersey dated July 29, 2013.

**99 Chapel Street**

On January 16, 2013, PennJersey Environmental Consulting, Inc. submitted a report summarizing historic environmental sampling performed on the 99 Chapel Street property on behalf of the property owner. According to the draft report, elevated metals are present throughout the subsurface on the property.

On March 26, 2013, EPA installed thirteen soil borings within the historic footprint of the Barth Smelting facility located on a portion of the 99 Chapel Street property. The borings were advanced to two feet bgs with soil samples collected from the following depth intervals: 0-1", 1-6", 6-12", 12-18", and 18-24" bgs. Asphalt paving was present throughout the eastern portion of the property on Block 2442, Lot 10, which sits immediately adjacent Chapel Street, and a thick subsurface concrete lens was encountered throughout the remaining portion of the property (Block 2442, Lots 11-12) at the 6-12" depth interval, with the thickness of the concrete paving varying from 6" to 12". An urban garden used by the two residents who live in an apartment located on the property was also sampled. All soil samples collected from the property were sent for laboratory analysis for TAL Metals plus mercury and tin.

Analytical results indicate the presence of elevated concentrations of lead exceeding the EPA's industrial soil screening level of 800 mg/kg in 14 soil samples. The concentrations of lead ranged from 15 mg/kg to 11,000 mg/kg, with the highest concentration of lead detected at the 12-18" depth interval. The complete results of this soil sampling are documented in Weston Solutions, Inc.'s Final Soil Sampling Trip Report for the Barth Smelting Site – Property P001 (99 Chapel Street), Newark, New Jersey dated June 12, 2013.

The paved surface on 99 Chapel Street appears to extend to the property line with the Terrell Homes based upon observations made in the field by EPA. Soil erosion and soil washout from beneath the paved surface on the 99 Chapel Street property was observed along the property boundary with the Terrell Homes.

**Essex County Riverfront Park (Block 2442, Lot 3)**

On June 6, 2011, PennJersey Environmental Consulting, Inc. submitted a Preliminary Assessment and Remedial Investigation Report (PA/RIR) to NJDEP for the property located at 59-97 Chapel Street Rear, Block 2442, Lot 3 in Newark, Essex County, New Jersey. According to the reports, several areas of concern were identified including elevated concentrations of metals present in historic fill material. At the time of the PA/RIR, the property was being used for industrial purposes and the elevated concentrations of metals were not addressed since they were present beneath asphalt paving.

The ECIA acquired several parcels of land in 2011, including the property at 59-97 Chapel Street Rear, and combined them to form one property for the development of recreational space, the Essex County Riverfront Park. The park encompasses 12.33 acres and is comprised of the following blocks and lots: Block 2025, Lot 2 (portion) and Lot 20; Block 2442, Lot 2 and Lot 3; Block 2473, Lot 1 and Lot 2; Block 2473.01, Lot 4; and Block 2473.02, Lot 1.

This entire property consisted of both NJDEP mapped and unmapped historic fill material, and site wide sampling demonstrated that metals are present across the property at concentrations exceeding the NJDEP's Impact to Ground Water Soil Remediation Standards. Since the property was to be developed as a county park with playground elements for children, the ECIA hired PS&S Engineering, Inc, an environmental consulting firm, to implement an NJDEP Presumptive Remedy, consisting of capping with at least two feet of

clean fill on top of a demarcation fabric across the property. Construction of the new park began in August 2011 and the park was officially opened ten months later on May 30, 2012.

Essex County Riverfront Park stretches from Brill Street to Oxford Street. It is bounded by the Terrell Homes property on the east side, the Passaic River on the north side, Raymond Boulevard on the south side and a public area along the Passaic River owned by the City of Newark on the west side. With Essex County Riverbank Park, the city greenway and Essex County Riverfront Park all now linked together, a public greenway stretching nine city blocks long stretches from Van Buren Street to Brill Street.

**Private Residential Homes on Chapel Street**

Not including the Terrell Homes housing complex, ten residential structures are present on Chapel Street between Lister Avenue and Albert Avenue. Most of the residential structures are multi-family dwellings that are tenant occupied. According to historical maps, most of the residential properties along Chapel Street in this one block area were constructed at the turn of the century or the early 1900's. Tenement structures are present on this portion of Chapel Street on the 1908 Sanborn map (see Appendix B).

On December 4, 2012, EPA collected soil samples from the backyards of two of the ten residential properties located on Chapel Street. The other properties were not sampled due to lack of access. Both properties are owned by the same property owner, and have undergone demolition and reconstruction within the past ten years. Based upon historical aerial photographs, the buildings present on the two lots sampled were demolished in 2006 and two new multi-family homes were constructed in their place. It was learned, from conversations with the property owner, that fill material was brought in to bring the properties up to grade during the construction activities.

Elevated lead levels are present in the top two feet of soil in both residential backyards sampled. The average lead concentrations at each depth interval (0-1", 1-6", 6-12", 12-18", and 18-24") is 743 mg/kg, 309 mg/kg, 2,492 mg/kg, 271 mg/kg, and 436 mg/kg, respectively. Maximum concentration found was 8,770 mg/kg in the 6-12" interval. It appears lead contaminated fill was utilized during the construction activities in 2006.

**5. Release or threatened release into the environment of a hazardous substance, or pollutant, or contaminant**

The following hazardous substance has been identified at the Site in significant concentrations:

| Substances Identified | Maximum Concentration | Statutory Source for a Hazardous Substance |
|---|---|---|
| Lead | 11,000 mg/kg | CWA §307(a)<br>CAA § 112 |

The mechanism for past releases to the environment appears to have been the Site's use in secondary zinc and copper smelting, lead battery manufacturing and possible waste disposal practices associated with these operations.

The pathways for release of lead into the environment include potential migration of lead dust in air and lead contaminated soil into the surface water. Numerous events could trigger releases, but the chief concerns at the site are wind dispersion of lead-contaminated dust and runoff of contaminated rainwater.

## III. THREAT TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

### A. Threats to Public Health or Welfare

EPA has identified conditions at the Site that meet the requirements of Section 300.415(b)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), (§40 CFR 300.415) which indicate that a removal action is necessary. Site conditions that correspond to factors that provide a basis for a removal action under Section 300.415 (b)(2) of the NCP include:

**(i) Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, or pollutants, or contaminants;**

There is a potential exposure to hazardous substances by nearby populations or the food chain. The Site includes a low-income residential housing complex that has concentrations of lead present in the surface soils at levels exceeding the EPA's residential soil screening level of 400 mg/kg.

Lead concentrations have been detected exceeding 400 mg/kg within the top one inch of soil at the playground and sprinkler park areas of the Terrell Homes, a low-income residential housing complex. The highest concentration of lead contamination in the top one inch of soil, 6,030 mg/kg, was found in the Eastern Playground area.

Direct contact with the elevated levels of lead within the top inch of soil may occur through common outdoor activities that occur on the residential property, or by tracking lead contaminated dirt inside the home. Contact with the lead contaminated soils may present a health risk to the residents, particularly young children. Both areas of the Terrell Homes property where elevated levels of lead exist, the sprinkler park and the former playground, cater to children. Children accessing these areas of the Terrell Homes could potentially be exposed to high levels of lead present within the top inch of soil.

Lead is a cumulative poison where increasing amounts can build up in the body eventually reaching a point where symptoms and disability occur. Particularly sensitive populations are women of child-bearing age, due to the fetal transfer of lead, and children. During pregnancy, lead that has accumulated in a woman's bones is removed from her bones and passes freely from mother to child; maternal and fetal blood lead levels are virtually identical. Once in the

fetal circulation, lead readily enters the developing brain through the immature blood–brain barrier. For children under the age of six, their innate curiosity and age-appropriate hand-to-mouth behavior result in bringing lead-containing or lead-coated objects, such as contaminated soil or dust, to their mouth, and thus greatly increasing their risk of exposure.

Exposure to low levels of lead is known to cause loss of cognition, shortening of attention span, alteration of behavior, dyslexia, attention deficit disorder, hypertension, renal impairment, immunotoxicity and toxicity to the reproductive organs. Other symptoms include: decreased physical fitness, fatigue, sleep disturbance, aching bones, abdominal pains, and decreased appetite.

The relationship between soil lead concentrations and the consequent impact on blood levels in children has been studied through numerous epidemiological studies. Based on these epidemiological studies, it is generally believed that persistent exposure to soil-borne lead results in an increase in blood lead levels (in children) of 1 to 9 micrograms per deciliter (ug/dl) per 1,000 mg/kg lead in soil. Although this relationship may become less robust as exposure durations decrease and soil lead levels increase, it nonetheless provides compelling evidence of the potential lead hazard associated with the excessive lead concentrations found in the soil at the Site.

Children under the age of six are especially vulnerable to lead poisoning, which can severely affect mental and physical development. Ingestion is the most common route of exposure to lead for children. In children, there is a wide range of neurological effects associated with lead exposure, some of which may be irreversible. Exposure to lead causes diminution in brain function and reduction in achievement that lasts throughout life. Some studies have found that for every 10 µg/dl increase in blood lead level, a child's intelligence quotient (IQ) was found to decrease by four to seven points. Some of the neurological effects of lead in children may persist well into adulthood; early exposures have been linked in several studies to increased rates of hyperactivity, inattentiveness, failure to graduate from high school, conduct disorder, juvenile delinquency, drug use, and incarceration.

The Department of Health and Human Services (DHHS) has determined that lead and lead compounds are reasonably anticipated to be human carcinogens based on limited evidence from studies in humans and sufficient evidence from animal studies, and the EPA has determined that lead is a probable human carcinogen.

**(iv) High levels of hazardous substances, or pollutants, or contaminants in soils largely at or near the surface, that may migrate; and**

Analytical data indicates that elevated levels of lead have been detected in the top two feet of soil at the playground and sprinkler park areas of the Terrell Homes. Lead has been detected in the soil at concentrations as high as 8,920 mg/kg at the 12-18" depth interval and in the top one inch of soil at concentrations as high as 6,030 mg/kg. The lead-containing soil at the housing complex can potentially become airborne and/or migrate when disturbed under dry conditions; and may migrate during heavy rain events or storm events.

**(v) Weather conditions that may cause hazardous substances, or pollutants, or contaminants to migrate or be released.**

Weather conditions may cause lead on the Site to migrate particularly through surface water run-off from precipitation and/or storm surge. The analytical data suggests that lead contamination has migrated outside the historical footprint of the former Barth Smelting facility onto the adjoining property perhaps through erosion, surface water runoff during rainfall events, storm surges, or earth moving activities.

Storm surges, like the one observed during Hurricane Sandy, could potentially cause contaminated soils in the playground and sprinkler areas at the Terrell Homes to migrate to other areas of the property or even inside residential units. These same storm surges could potentially aggravate the erosion of soil along the property line beneath the cap on the 99 Chapel Street property potentially causing the migration of contaminated soils onto the Terrell Homes property.

## B. Threats to the Environment

At this time there is no documentation to indicate that the Site is currently having an acute impact to any sensitive environments or natural resources.

## IV. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Delayed action will increase the potential for exposure to elevated levels of lead on the residential properties. Migration of the lead contaminated soils could occur over time increasing the overall extent of the cleanup.

## V. CONCLUSIONS

The Site is considered a facility as defined by Section 300.5 of the NCP and Section 101(9) of CERCLA, 42 U.S.C. § 9601(9). A release of hazardous substances has occurred on the Site in a quantity and concentration that may present a threat to the public health and the environment. There is a current exposure pathway existing to humans and the environment that may present an imminent and substantial endangerment to the public health and welfare. No other party, government or otherwise, is currently available to take a timely response action to mitigate the threat.

Lead exists in surface and subsurface soils on the Terrell Homes residential housing complex at levels which exceed EPA's residential soil screening level of 400 mg/kg. Based on the high concentrations of lead in the soil in the playground and recreational areas at the Site and other use areas, the uncontrolled release of lead poses a health threat to unprotected individuals accessing the Site.

The elevated levels of lead present beneath the paving at the 99 Chapel Street property could potentially migrate onto the neighboring residential housing property (Terrell Homes) due to

the erosion of the concrete curbing along the property boundary. Evidence of potential ongoing erosion of this concrete barrier has been observed in the field.

While lead is present at concentrations exceeding the residential screening criteria of 400 mg/kg in the backyard surface soils at the two private residential homes on Chapel Street, the lead does not appear to be related to the Site. Based upon the recent construction of the homes and the grading of the properties with fill material brought in from an outside source, the lead present in the surface soils is likely unrelated to the Site.

## VI. RECOMMENDATIONS

It is recommended that a CERCLA Time-Critical removal action be undertaken to address the uncontrolled release of lead at the Site. The removal action would address the unpaved portions of the Terrell Homes property that contain elevated concentrations of lead in the surface and subsurface soil. In addition, engineering controls should be implemented along the property line between the Terrell Homes and 99 Chapel Street to prevent the migration of contaminated soils from 99 Chapel Street resulting from continued erosion of the concrete curb/wall along the property boundary. The 99 Chapel Street property proper is covered with an asphalt cap and the Essex County Riverfront Park is capped with two feet of clean fill so no additional CERCLA removal activities are required on these properties.

At the two private residential properties on Chapel Street sampled in December 2012, lead concentrations have been detected exceeding the EPA residential soil screening level of 400 mg/kg within the top one inch of soil at both properties. These residential properties have elevated levels of lead outside the drip line in the top two feet of soil. The highest concentration of lead contamination in the top inch of soil found in the backyards of the properties is 818 mg/kg, however based upon historical photos and information provided by the property owner, the lead detected in the surface soil in both backyards is related to imported fill material and is not site related. As a result, a CERCLA removal action is not warranted on these properties.


## Legend

Site Location

0 0.075 0.15 0.3 0.45 0.6 Miles

N

**Weston Solutions, Inc.**
**Northeast Division**

In Association With
H & S Environmental, Inc.,
Scientific and Environmental Associates, Inc.
and Avatar Environmental, LLC.

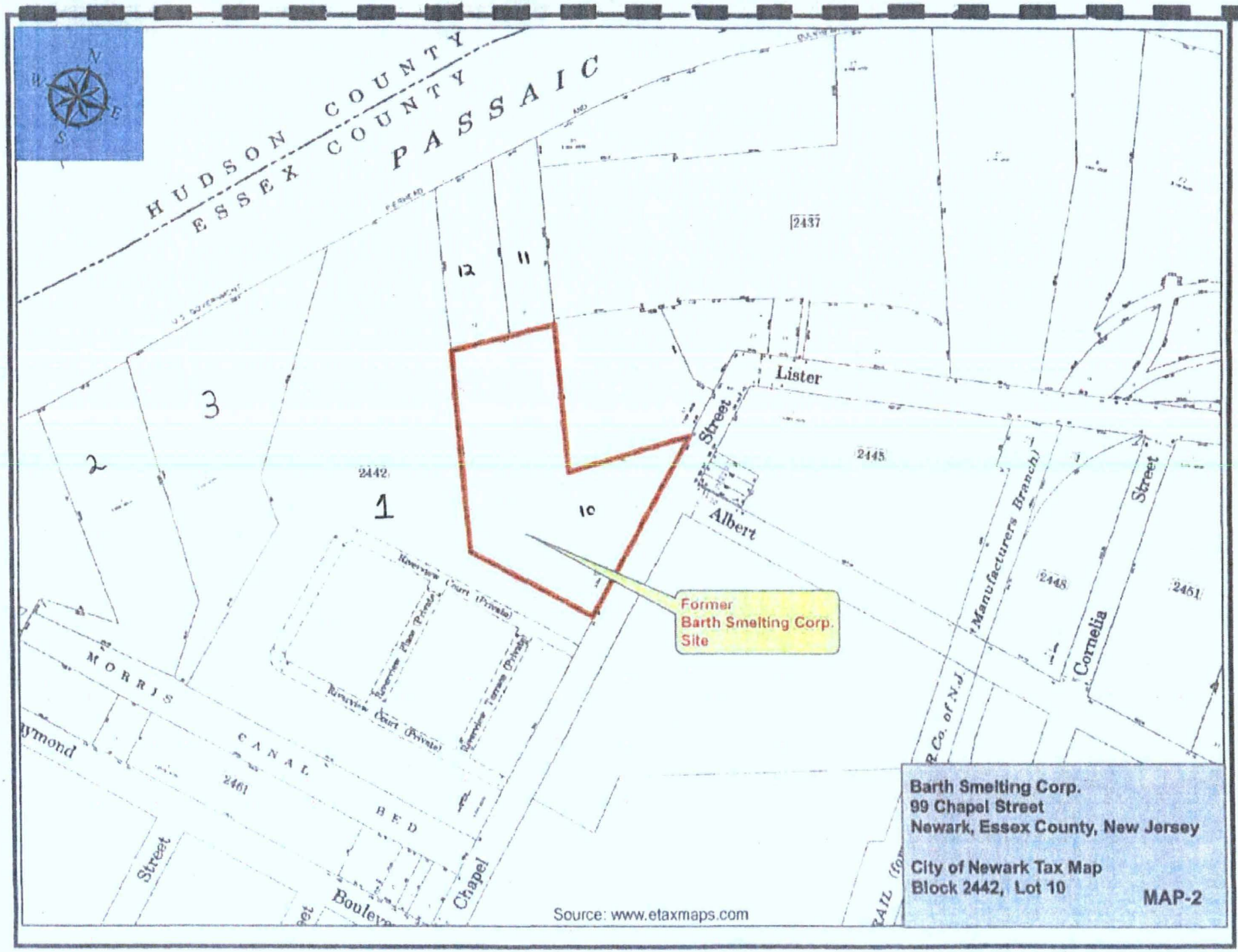
**Figure 1**
**Site Location Map**

**Barth Smelting Corporation Site**
**Newark, New Jersey**

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMOVAL SUPPORT TEAM 2
CONTRACT # EP-W-06-072

| | |
|---|---|
| GIS ANALYST | T. BENTON |
| EPA OSC | K. STARGER |
| REST. SPM. | S. SNYDER |
| FILENAME | SITEMAP.MXD |

DATE MODIFIED 1/24/2012

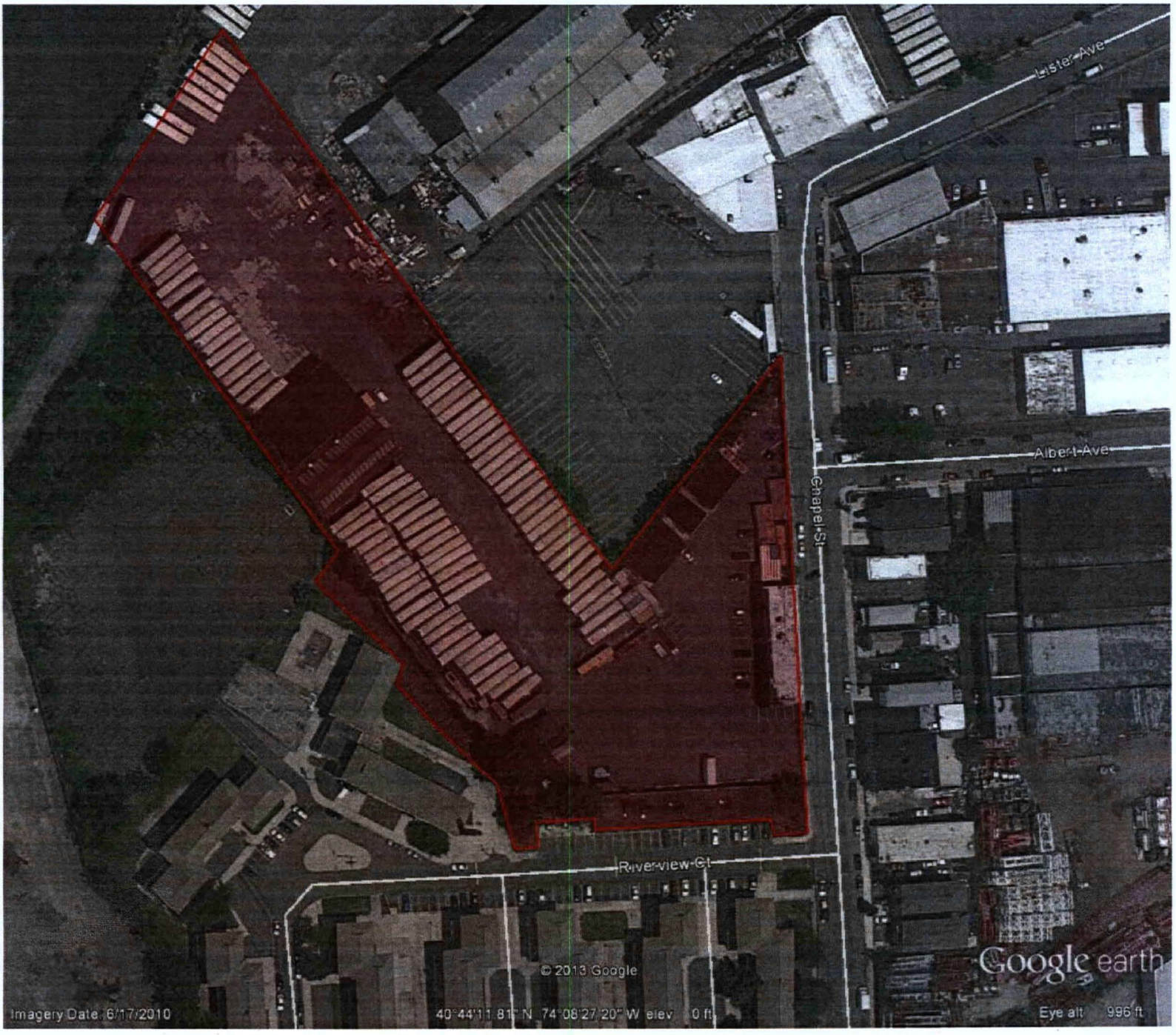

HUDSON COUNTY
ESSEX COUNTY
PASSAIC
2437
12
11
3
2
2442
1
10
Lister
Street
2445
Albert
Manufacturers Branch
Cornelia
Street
2448
2451
Former
Barth Smelting Corp.
Site
MORRIS
CANAL
BED
2461
Riverview Court (Private)
Riverview Place (Private)
Riverview Terrace (Private)
Chapel
Street
Barth Smelting Corp.
99 Chapel Street
Newark, Essex County, New Jersey
City of Newark Tax Map
Block 2442, Lot 10
MAP-2
Source: www.etaxmaps.com

Appendix A

Figure 3

Barth Smelting Site map

- Shaded red area represents the Barth Smelting Site



Appendix A
Figure 4

Historic footprint of Barth Smelting outlined in Red

Appendix A

Figure 5

Historic footprint of New Jersey Zinc outlined in yellow

- Barth Smelting operated on a small parcel that was formerly part of the New Jersey Zinc operations

Appendix A Figure 6


**Barth Smelting Corp.**
**99 Chapel Street**
**Newark, Essesx County, New Jersey**

**MAP-1**

Appendix A

Figure 7

Footprint of Terrell Homes property
Former playground area outlined in red